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# Therapeutic Gazette.

WHOLE SERIES, VOL. XXV. DETROIT, MICH., APRIL 15, 1901. THIRD SERIES, VOL. XVII, No. 4.

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## Original Communications.

### *PUERPERAL MASTITIS: ITS PREVENTION AND TREATMENT.*

BY EDWARD P. DAVIS, A.M., M.D.,
Professor of Obstetrics in the Jefferson Medical College; Professor of Obstetrics and Diseases of Infancy in the Philadelphia Polyclinic; Visiting Obstetrician to the Jefferson, Philadelphia, and Polyclinic Hospitals, etc.

The most usual cause of puerperal mastitis is infection. Attention has long been drawn to the dangers which accompany cracks and fissures of the nipple and septic infection in the puerperal woman. We have not, however, been familiar with the fact that many nonparturient women have inflammation of the breast, and that in some cases pus-forming germs are present in the breast before the child is nursed.

The mammary gland is one whose circulation is easily altered, and in which infection finds a fruitful soil. Many patients suffer from swelling and pain in the breasts at the menstrual period. This is well illustrated in the following case: A married woman, not pregnant, consulted the writer for a lump in the right breast which gave her much anxiety. On examination, a hard tumor the size of a small egg was found in the right lower quadrant. The tumor was slightly sensitive; the nipple

was not retracted; the axillary glands were not involved. Upon close questioning, the patient stated that she first noticed this enlargement during the menstrual period which had just closed, and that before menstruation she had been much occupied with the packing of trunks, and had used her right arm to excess. The patient was given some simple medicine to engage her attention, the digestive tract was freely emptied by laxatives, and she was asked to report in ten days. She did so, when the tumor could not be felt. She has not reported since for this condition, although she has received advice for other illness.

Tubercular infection of the female breast may be properly suspected in cases of chronic tumor with a serous discharge, in a patient of tubercular tendencies and in whom the tumor grows slowly but steadily. Should pregnancy occur in such a patient, the tumor would rapidly increase and a mixed infection with pus formation very probably occur. The following case is illustrative of this point: A young woman was admitted to the Jefferson Maternity for confinement. Upon examining the breasts, the right was found to be slightly hardened in several areas and watery fluid exuded from the nipple. The patient stated that this hardness had been present for several months and that it was increasing in size. Some of the fluid was extracted by the breast pump and subjected to examination, when tubercle bacilli were found. As the patient was near term, she was allowed to go through her confinement. She did not nurse the child from that breast, but from the other, which showed no signs of disease. When she was convalescent, the entire breast was removed, the axilla not being infected. An examination of the gland showed the lesions characteristic of tuberculosis. The patient was kept under observation for a month after the birth of her child, no further evidences of tubercular disease appearing.

Suppurative inflammation of the breast may be feared in patients who have had inflammation in the breast at any time before becoming pregnant. Puerperal mastitis tends to recur with each confinement. A traumatic lesion of the mammary gland also predisposes to puerperal mastitis.

In undertaking investigations a few years ago regarding the sources of infection to which new-born children are exposed, the writer observed that in some cases milk taken from the breast of the mother before the child had nursed contained staphylococci. In these cases no previous pregnancy had occurred, there was no history of traumatism, and no adequate explanation of the presence of these germs within the breast. They were undoubtedly the result of a previous inflammation, or were possibly conveyed from a focus in another portion of the body, having been transmitted by the blood current.*

Infected cracks or fissures in the nipple remain by far the most frequent sources of puerperal mastitis. Much can be done to obviate this complication if the patient be examined comparatively early in pregnancy and the nipples be drawn out and the epithelia healed by suitable antiseptic ointments. The application of hardening agents to the nipple is distinctly injurious, as it strongly encourages the tendency to cracks and fissures. Lanolin and boracic acid ten grains to the ounce, subnitrate of bismuth and castor oil in the same strength, cocoa butter and boracic acid, or sterile olive oil, are all excellent for this purpose. The breast and nipple should be washed with Castile soap and warm water, the nipple drawn out by the thumb and finger, and the ointment thoroughly but gently applied. If the nipple cannot be thoroughly drawn out by the thumb and finger, it may be necessary to use the breast pump, applying it very gently. Few cases are seen in which the nipple cannot be suitably prepared by these measures.

When cracks or fissures are present, immediate precautions must be taken to prevent infection. The patient should wear a breast bandage, and the nipples be covered by a small square of sterile gauze. Before and after nursing the child's mouth should be cleansed with a saturated solution of boracic acid, and the nipples should also be thoroughly cleansed with the same agent. When the child nurses, a sterile nipple shield should be put over the nipple for its protection. A borated ointment should be applied to the nipple after the child has nursed and the nipple has been cleansed to promote healing. Where the crack is so severe that the nipple bleeds, a few applications of glycerole of tannin usually control the bleeding. Very rarely the fissure must be touched by a weak solution of nitrate of silver.

It is of great importance in preventing suppuration that stasis of milk or engorgement of the breast does not occur. The breast

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* *Archives of Pediatrics.*

must drain in order to relieve the pressure of milk, and also to give exit to milk which may contain staphylococci. Accordingly an important part of the treatment for the prevention of mastitis consists in the proper drainage of the breasts. This may be effected by massage, the use of the breast pump, the employment of a properly fitting bandage, and by utilizing the nursing of the child. In some cases the engorgement is so great that the child nurses with difficulty. With these patients it is best to massage the breasts thoroughly before the child is to nurse, then to apply the breast pump until the milk flows freely, and then to allow the child to nurse. In cases where the breasts are extremely hard, hot applications should precede massage. These may be of two sorts—a hot wet application or fomentation, or the use of a bag containing hot water giving dry heat. If the fomentation is employed, it should be of the softest flannel, which has been boiled, and which should be wrung out of boiled water with clean hands.

To obtain success in relieving engorged breasts, almost constant attention is necessary. The sequence of treatment is also important and should be as follows: In obstinate cases, first the application of warmth; then massage with warm sterile olive oil; then the application of the breast pump, removing from two drachms to an ounce of milk; and then the nursing of the child. If this sequence be observed, there are few cases which will not be promptly relieved.

To preserve the nipples in an aseptic condition, boracic acid is the most available antiseptic. This may be used in solution applied upon small pieces of boiled soft linen retained in position by a square of sterile gauze and a breast bandage. In some cases a dusting powder after the nipple has been cleansed is beneficial, and aristol often serves a useful purpose. Boracic acid may be used in ointment in fissures and cracks of the nipple to advantage. In some cases the child objects to the taste of an ointment, and sterile olive oil may be used instead. In cases where the child dies and the secretion of milk must be checked as soon as possible, care must be taken to relieve the breasts of engorgement and to drain away a portion of the milk secreted. The treatment just described answers well in these cases, with the exception of those in which there is a rise of temperature and obstinate distention of the breast, and soreness. Here the application of cold is often followed by very happy results. A tight ice-bag is laid upon the breast most painful, protected by flannel. Massage and the use of the breast pump may be added to this treatment with sufficient frequency to relieve engorgement. The diet of the patient should be largely solid, as little liquid as possible being taken, and the bowels should be kept freely open by the use of salines.

While various drugs have a reputation for checking the secretion of milk, we are familiar with none which can be used in sufficient quantity without impairing the patient's digestion and general health. We prefer to rely upon the local treatment described, selected diet, and saline purgation, rather than upon the use of drugs.

Cases are sometimes seen in which the nipple is so malformed or affected by disease that the breast cannot be drained through this channel. In these patients the use of the breast pump is without avail, and the physician must rely upon compression, cold or heat, selected diet, and purgation. Massage is useful to a limited extent if given with great gentleness. The danger of abscess in such a case is considerable, and the physician must be ready to incise promptly and drain an area of infection.

The diagnosis of abscess of the breast is often difficult. Such begins in a small area not large enough to give distinct fluctuation. A breast soft and full of milk gives a fluctuation difficult to distinguish from that of a small abscess. It is better to rely upon the presence of an area of hardness with pain on pressure and rise of temperature than to wait for the development of fluctuation. In some cases the temperature rises rapidly to a considerable height, then falling to normal; in others the rise of temperature is gradual and accompanied by the persistence of a hard and sensitive area. Pain, a hardened area, and elevation of temperature will yield in simple cases to heat or cold, massage, pumping, and saline purgation. The effort should be made to check the disease by this treatment, and usually success will result. If, however, the temperature does not fall, the breast does not soften, the free discharge of milk does not occur, and the area of hardness increases rather than diminishes, the suspicion of infection must be entertained and incision should be practiced.

In some cases a small area of distinct fluctuation is present. The skin over this area in patients not hysterical or highly sensitive

may be partially frozen and a small incision made with a sharp bistoury. The pocket should be washed out with peroxide of hydrogen, and a strip of gauze inserted for drainage. Unless the physician can distinctly limit the fluctuation to a small area, the patient should be anesthetized and the breast thoroughly explored under antiseptic precautions.

To thoroughly explore the breast, the physician requires a scalpel, a grooved director, forceps for carrying gauze or drainage tubing into wounds, scissors, and a small glass piston syringe. The patient should be anesthetized with ether, the parts made antiseptic, and antiseptic precautions observed. The operator should first endeavor to determine the point of most decided fluctuation. He will usually find one small area which can be distinguished from the remainder of the breast; this is usually not far from the nipple. This area is incised sufficiently to permit not only the free exit of pus, but the introduction of the operator's finger. By firm but gentle pressure the operator should endeavor to break down any partitions between the original focus and adjacent foci, and in this way to make one abscess of the surrounding infected tissues. The finger can usually trace the path of infection by the breaking down of the glandular substance, and the breast should be explored from the central focus as thoroughly as possible. It is then washed out with peroxide of hydrogen or lysol one per cent, or sterile salt solution, and the operator decides upon the method of drainage. If but one septic focus be found and that near the center of the breast, it can be drained by a packing of gauze. If, however, the breast is honeycombed, the operator must choose the lowest point or one or more openings for drainage. It is usually best to pass good-sized soft-rubber tubes from the highest to the lowest point of the infected area. These should be thoroughly flushed out and the breast enveloped in a copious antiseptic dressing. At each dressing the tubes should be flushed clean, and so soon as no discharge passes through them they should be removed and the lower openings kept patent by packing with iodoform gauze.

Submammary abscess is sometimes seen in which there is no distinct area of fluctuation in the breast, but the whole gland is raised and carried usually toward the center line. There may be considerable fever and the case may puzzle the observer, because he fails to find fluctuation in the breast. An incision at the lower border of the gland will usually open the abscess.

In neglected cases infection may travel into the axilla, the lymphatic glands of that region suppurate, and axillary abscess may complicate the puerperal condition.

It is sometimes better to err on the side of too early incision than to delay too long. Even though the operator cannot recognize fluctuation, a hardened area which is painful and which resists the treatment described may properly be incised. The result of such incision is good. The hardness disappears and the breast resumes its normal condition.

In making incisions into the breasts, the anatomical arrangement of the milk ducts must be kept in mind, and the incision made parallel with the ducts and not across them.

Shall the milk in an infected breast be entirely discarded in the feeding of the infant? It is undoubtedly safer not to give the child milk from an infected breast. The same germs which produced pus in the breast may infect the intestines. While the breast remains infected, it is best to extract its contents by the pump and not to use the milk in the feeding of the child.

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## *GASTROSTOMY FOR THE RELIEF OF PAINFUL DEGLUTITION INCIDENT TO TUBERCULOUS LARYNGITIS.*

By Edward Martin, M.D.,
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Gastrostomy, or the formation of an artificial opening into the stomach through which nourishment can be introduced into this viscus, has been practiced when, because of esophageal occlusion intractable to surgical treatment, it has been impossible to feed the patient by the natural route. It has found its chief application in the relief of the inanition attendant upon the obstruction due to cancer and cicatricial contraction of the esophagus.

At the period when the technique of this operation was imperfect, and when the simple opening of the peritoneal cavity was attended by much risk, it is clear that the comparatively limited indications just given could not with justice be widely extended. Now that the operation can be quickly performed, is absolutely efficacious, and is free from risk or inconvenience either immediate or remote, there seems no good reason why it should not be utilized as a means of

relief for the distress consequent upon painful deglutition.

As is well known, tuberculous laryngitis may cause such excessive pain on swallowing that patients perish of inanition rather than subject themselves to frequent repetitions of this torture. The pain, even if rendered bearable by chloretone, orthoform, or cocaine, may still be sufficient to cause a distaste for food, or a disinclination to take it, which militates strongly against the patient's recovery.

It was in such a case that Dr. F. H. Macfarlane, struck by the rapid and progressive emaciation of a boy of nineteen, in whom the tuberculous lesions were most pronounced in the larynx, proposed gastrostomy. He argued that the progress of the tuberculous disease would be best resisted by hypernutrition. He found that this hypernutrition was impossible because of the agony experienced by the patient in the act of swallowing. It was in the hope of being able to feed the boy to the full limit of his stomach capacity that the operation was suggested.

The reasons for this operation seemed so perfectly clear that I had no hesitation in performing it.

Practically the Witzel and the Ssabanajew-Frank methods were the only two to be considered. The Witzel operation is performed by placing a tube upon the stomach wall and infolding it by stitches for two or three inches. The end of this tube is then thrust through a small opening in the stomach, which is closed about the tube by sutures. There is thus formed a two-inch air-tight canal parallel to the wall of the stomach running down to the perforation in this viscus. The stomach is then secured to the parietal opening and the wound is closed.

This operation, though perfectly simple, has seemed to be less sure of preventing leakage than the Ssabanajew-Frank method. In accordance with the latter procedure, two incisions are made—the first along the left costal border. Through this first incision a portion of the stomach wall is drawn. The second incision is then made through the skin an inch or two to the left, and the tip of the gastric pouch, which has been drawn through the peritoneal opening, is pulled beneath the bridge of skin and secured to the borders of the second incision, the first cut being closed. It sometimes happens that, owing to a contracted stomach, this procedure is impracticable.

In this case, however, the operation proved to be extremely simple. An incision was made to the left of the middle line, the stomach was seized with forceps and drawn out until a pouch presented itself of sufficient length to be carried upward over the costal border. A second incision was made above the costal border, the muscles were tunneled, and a vulsellum forceps passed through this second incision seized the pouch and drew it up until its end presented beyond the skin. The abdominal incision was then closed without suturing the stomach to the parietal peritoneum at this point, and the operation was completed by suturing the stomach wall to the skin borders of the upper incision, after which a catheter was introduced into the stomach.

The whole procedure required a very few minutes. There was no shock. The patient recovered from the anesthetic in less than half an hour, experienced no after-pain or inconvenience of any kind. He was very grateful for the relief of the pain incident to swallowing, and complained only of dryness of the throat. Because of his harassing and persistent cough there was more irritation about the skin orifice of the gastric fistula than is usual. When this complication is to be expected it would be better not to draw the gastric pouch over the costal border.

This operation is so easy and safe, and so unlikely to be followed by unpleasant consequences, that it might be employed in cases of cancer of the tongue, throat, or the larynx, or in any of the diseases or operations which make the ingestion of food difficult, painful, or dangerous.

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## *THE BLOOD-PRESSURE-RAISING PRINCIPLE OF THE SUPRARENAL GLANDS —A PRELIMINARY REPORT.**

By Dr. Jokichi Takamine,
New York.

Since Addison, in 1855, pointed out that in the disease bearing his name there are certain constant changes in the suprarenal gland, many able investigators have directed their attention to the study of this interesting organ.

The researches of Brown-Sequard, Oliver, Schafer, Pellacani, Foa, Vincent, Cybulski, Bates, Moore, Swain, Cohen, Floersheim, and others, have established beyond doubt the fact that certain constituents of the supra-

*Read before the annual meeting of the New York State Medical Society, January, 1901.

renal gland possess marvelous physiological activity and valuable therapeutic properties.

As the active principle of the gland dissolves readily in water, the aqueous extract of the fresh gland was used with good results; but like all animal extracts, it deteriorates very rapidly, becoming utterly useless and sometimes quite dangerous. The fresh extract, when carefully sterilized, keeps a considerable length of time, but the moment the bottle is opened it is very prone to decompose. Various preservatives have been tried, but very few have proved successful. The desiccated gland is also used, and from it the extract may be made fresh each time it is needed.

The chief objections to the above preparations are the uncertainty of their physiological activity, the presence of a large amount of foreign matter, and their proneness to decomposition. Of late years various attempts to isolate the active principle of the gland have been made by several physiologists and physiological chemists, among whom may be mentioned Prof. J. J. Abel of Johns Hopkins University, Dr. B. Moore of London University, and Dr. O. v. Furth of the Physiological Chemical Institute of Strassburg, all prominent workers in this field. Dr. J. J. Abel published his first paper on this subject in 1897 in the July number of the *Bulletin of the Johns Hopkins Hospital*, and his second paper in 1898 in the September and October numbers of the same publication. In the latter he announced that he had isolated the active principle of the gland, and named it "epinephrin." Shortly afterwards Dr. O. v. Furth reported the results of his investigation of the gland, and made a severe criticism of Abel's "epinephrin," declaring that it is nothing more than an inactive foreign matter contaminated with some of the active principle. Furth claimed to have attained the isolation of the active principle by different methods, and called his product "suprarenin." Abel obtained "epinephrin" by treating, in an autoclave, a benzoyl compound obtained from the gland extract with benzoyl chloride and sodium hydroxide, after the Baumann-Schotten method; while Furth obtained "suprarenin" from the filtrate in which Abel considered "epinephrin" did not exist.

In July, 1899, another paper by Dr. Abel appeared in the *Zeitschrift f. Physiologische Chemie* in which he opposed his opinion to that of O. v. Furth, and gave also a number of results of chemical analyses of "epinephrin." Notwithstanding his effort to solve the question, there is still room for controversy, for he could not obtain "epinephrin" in a chemically pure form. Neither could Furth obtain "suprarenin" in a pure state.

Having been interested in this subject for some time I recently commenced to make research along that line. I am now pleased to announce that I have succeeded in isolating the blood-pressure-raising principle of the gland in a stable and pure crystalline form. Although I will not go into the details of the method of preparation, in this preliminary note, I may state that the method I have employed is entirely different from either of those used by Abel and Furth.

I desire by no means to usurp credit due to the pioneer investigators; yet in view of the facts that neither of the authors quoted has obtained the active principle in pure form, and that there still exists some room for controversy between them, for convenience sake I have termed the blood-pressure-raising principle "adrenalin."

Adrenalin is a light, white, microcrystalline substance, showing itself thus far in five different forms of crystals, which vary according to the condition of the solutions from which they are made. In fact, the crystals can be transformed from one shape to another by different methods of crystallization. The five different forms are: (1) Wart- or tomato-shape; (2) boat- or leaf-shape; (3) rhombic plates and their agglomerations; (4) fine needles; (5) prism-shape.

Adrenalin has a slightly bitter taste and leaves a numbed feeling on the tongue at the spot where it has been applied. When dry it is perfectly stable. On heating, it turns brown at 205° C., and melts, decomposes, and swells, simultaneously, at 207° C. Adrenalin shows a slightly alkaline reaction on moistened litmus paper; phenolphthalein also indicates slight alkalinity. It is with difficulty soluble in cold water, and more readily in hot water. From the hot, saturated, aqueous solution the crystals separate after cooling. The colorless aqueous solution of adrenalin is easily oxidized by contact with the air, its color changing from pink to red, and eventually to brown. Adrenalin is easily soluble in acids or alkalies, but not in ammonium hydroxide or solutions of the alkaline carbonates. The following reactions are most characteristic. The addition of ferric chloride to a solution of adrenalin produces a beautiful emerald green color, which by careful addition of caustic

alkali becomes purple, and then carmine red. Strong acid prevents the reaction with ferric chloride, limiting the change of color to a dirty yellowish-green. It reduces silver salts and gold chloride very energetically, and besides, turns the liquid red. Oxidizing agents, such as ferricyanide and bichromate, behave in the same way. None of the following alkaloidal reagents produces a precipitation: mercuric potassium iodide; picric acid; tannic acid; phosphomolybdic acid; phosphotungstic acid; mercuric chloride; potassium bichromate; platinum chloride.

Adrenalin is very soluble in acids, and forms salts which are crystallizable with difficulty. I made three kinds of salts—hydrochlorates, sulphates, and benzoates—by carefully dissolving adrenalin with the three different acids, and evaporating, *in vacuo*, over strong sulphuric acid. In course of time the residues became brown, brittle, amorphous masses, deliquescent in the air. So far my efforts to crystallize them have failed.

The alkalinity of adrenalin is approximately as follows:

100 parts adrenalin=27.38 parts $H_2SO_4$.

Adrenalin is also soluble in caustic alkali, but as it dissolves it is easily affected by the oxygen of the air; I have been unable, thus far, to obtain its definite compound.

The physiological activity of adrenalin is astoundingly strong. A fraction of one drop of an aqueous solution of adrenalin, or its salt, having the strength of 1: 10,000, blanches the normal conjunctiva within thirty to sixty seconds. It is a powerful astringent.

Intravenous injection of adrenalin produces a powerful action upon the muscular system in general, but especially upon the muscular walls of the blood-vessels, and the muscular wall of the heart, resulting in an enormous rise of blood-pressure.

The intravenous injection of 0.000016 gramme of adrenalin in the form of the chloride, upon a dog weighing 30 pounds, or 15.5 kilos, raised the blood-pressure corresponding to nearly nine millimeters of mercury. The amount of adrenalin injected, per kilo of body weight, was nearly one-millionth part of a gramme.

A comparative test of the strength of adrenalin with that of the fresh extract of suprarenal gland, one cubic centimeter of which represents one gramme of fresh gland, was carried out on a dog weighing seven kilos. Adrenalin solution, corresponding to 0.000008 gramme, was intravenously injected, and it was observed that the rise in blood-pressure equaled fourteen millimeters of mercury. In order to cause an equal rise in blood-pressure it was necessary to give 0.005 gramme of the suprarenal extract. These data show that adrenalin is 625 times stronger than suprarenal extract. The sample of adrenalin used for this experiment contained some mineral impurities, so that pure adrenalin will be over 1000 times stronger than an extract of the fresh gland.

The amount of adrenalin, per kilo of body weight, required to raise the blood-pressure to 14 millimeters of mercury is one-millionth part of one gramme. One-fourteenth part of the above quantity of adrenalin may safely be assumed to raise the blood-pressure one millimeter of mercury, or at least to produce some physiological effect upon the heart and the blood-pressure. We thus arrive at the wonderful conclusion that adrenalin, administered in a quantity of not more than one-fourteen-millionth part of one gramme per kilo of body weight, will produce distinct physiological results. Thus, approximately, $\frac{1}{200,000}$ gramme of adrenalin, intravenously injected into an adult man, is sufficient to produce some distinct effect.

The therapeutic applications of adrenalin are already numerous, and new uses for it are constantly being found out by different experimenters. Generally speaking, adrenalin, when locally applied, is the most powerful astringent and hemostatic known. It is useful in all forms of inflammation, and it is the strongest stimulant of the heart. It is non-irritating, non-poisonous, non-cumulative, and without injurious properties. It has given satisfactory results in the treatment of the following diseases and conditions: Acute conjunctivitis; some cases of deafness; bloodless operations on the nose and throat; laryngeal phthisis; hay-fever; nasal hemorrhage; "bleeders;" diseases of the heart; diseases of the nose and throat; asthma; laryngitis; diseases of the urethra; Addison's disease; exophthalmic goitre, etc., etc. The therapeutic efficacy of adrenalin has already been established, beyond doubt, in the short time that has elapsed since its first production, and it will unquestionably attain to a prominent place in the materia medica.

In concluding this paper I desire to state that my thanks are due to Dr. E. M. Houghton, of Detroit, for making the physiological tests, and also my thanks and a large share

of credit are due to Mr. Wooyenaka, my associate, for his energetic and able assistance in accomplishing this interesting investigation.

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## *THE PHYSIOLOGICAL RELATIONS OF SCOPOLIA CARNIOLICA TO ATROPA BELLADONNA.*

By Horatio C. Wood, Jr., M.D.,
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It is a matter of common knowledge that true belladonna is frequently replaced, especially in the manufacture of plasters, by the so-called "Japanese belladonna," *Scopolia Carniolica.** This substitution has become so important, both from a commercial and scientific standpoint, that the American Pharmaceutical Association has undertaken an elaborate investigation of the subject. This investigation includes studies of the botanical, chemical, physiological, and clinical aspects of the question. I was requested by Dr. H. H. Rusby, member of the Research Committee of the A. Ph. A. having charge of the matter, to make the physiological research of the comparative value of the two plants. This paper, therefore, forms part of a much wider investigation, and is to be considered in connection with the other studies conducted under the auspices of the committee. Although the chemistry of these two plants is to be the subject of a special research by Prof. A. B. Prescott, it may be permitted as necessary to an intelligent discussion of their physiological relations to call attention to our present knowledge of these drugs. It is generally conceded that in the *Atropa Belladonna* there are present two (possibly more) important alkaloids—atropine and hyoscyamine—and that *Scopolia Carniolica* contains probably hyoscyamine and hyoscine. It must be remembered that the proportion of hyoscine in the scopolia rhizome is very small; otherwise one would be led to conclude *a priori*, on account of the differences between hyoscine and atropine, that the two plants could not have similar therapeutic virtues.

Concerning the physiological action of hyoscyamine, the dominant alkaloid of scopolia, the studies of Laurent,* Oliver †, Guauck ‡, and numerous other investigators, have given us a fairly complete knowledge. Without discussing this literature in detail I quote from Husemann § the summary of these concordant researches: "Hyoscyamine acts locally like atropine, constricting the blood-vessels; it increases the pulse-rate by paralysis of the vagus peripherally, and in small doses elevates the blood-pressure." Hyoscyamine also acts like atropine in dilating the pupil, lessening secretion, and increasing respiration. It is common belief that hyoscyamine is more hypnotic than atropine, and does not produce the violent delirium characteristic of atropine poisoning. But as Cushny ‖ points out, the difference is so slight that only careful studies with absolutely pure drugs, which are unfortunately noticeably lacking, would justify positive conclusions; and certain it is that in some cases of poisoning by hyoscyamus the delirium has been of a very active nature.

For the purpose of comparison I have studied the effects of the separated alkaloids, tinctures, and fluid extracts of both drugs, all of which were prepared especially for this research. These were made by Parke, Davis & Co. from roots bought of various importers and carefully examined as to their botanical identity by Dr. Rusby. The experiments were performed on frogs, rabbits, and dogs.

In frogs both drugs produced, when given hypodermically, a rapidly increasing paralysis. As was first shown by Fraser,¶ when large sublethal doses are given the paralysis occasioned by atropine is followed by a condition of exaggerated reflexes, frequently associated with motor weakness. This sequence of symptoms is commonly attributed to a depression of the inhibitory center of the cord, which still endures after the paralysis of the motor cells has passed off. I have found that this paralysis of Setschenow's center is equally well marked after the use of the scopolia alkaloids as after atropine.

Studies of the paralyses by means of Turck's method, while not revealing any essential difference between the actions of the two drugs, tended to confirm the gener-

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* The term "Japanese Belladonna" refers more properly to *S. Japonica*, but is sometimes used to indicate the genus. The Japanese believe the *S. Japonica* to be identical in its therapeutic virtues with true belladonna.

* Laurent: Thesis, Paris, 1870.

† Oliver: *American Journal of the Medical Sciences*, 1881.

‡ Guauck: *Verhandl. d. Physiol. Gesellschaft*, Berlin, 1881.

§ Husemann: Pflanzenstoffe, p. 1220.

‖ Cushny: Pharmacology and Therapeutics, 1899.

¶ Fraser: Trans. Roy. Soc. Edinburgh, 1872.

ally accepted opinion that scopolia is somewhat more actively depressant to the motor cord than is belladonna.

As scopolia has been substituted for belladonna, especially for local uses, it seemed advisable to test their comparative effects when applied directly to a motor nerve. For this purpose the gastrocnemius muscle with its tributary nerve was prepared and allowed to soak in solutions of the alkaloids, and its electric irritability tested from time to time.

*Scopolia.*—3.53. Nerve in soak in one-tenth-per-cent solution of scopolia alkaloids in normal saline.

3.56. Responds well.

4.01. Responds well.

4.06. Does not respond, but will respond to slightly stronger stimulation.

4.52. Responds only to very strong currents.

*Belladonna.*—3.59. Nerve in soak in one-tenth-per-cent solution belladonna alkaloids.

4.02. Responds well.

4.11. Responds well.

4.15. Does not respond, but does respond to slightly stronger current.

4.52. Responds only to very strong currents.

From these experiments, which represent fairly the whole series, it will be seen that, qualitatively at least, in the frog no distinct difference between the effects of scopolia and belladonna can be made.

*Mammals.*—Most of the studies of the effects of these drugs on blood-pressure and respiration were made on dogs, while the general effects following hypodermic injection were observed on rabbits. Although a large number of these latter experiments were made, it was chiefly with the purpose of studying the dose. Suffice it to say, therefore, that with both drugs there was a hurrying of the respiration with increasing muscular weakness, followed by coma and death from asphyxia. No symptoms of excitement were observed with either drug, but frequently convulsions, probably asphyctic in origin, immediately preceded death.

*Blood-pressure.*—Both scopolia and belladonna were found to cause a rise of the blood-pressure, which was accompanied by an increase in the rate of the pulse. The rapidity of the pulse was evidently due in both cases to paralysis of the intrinsic cardiac inhibitory mechanism, since stimulation of the pneumogastric nerve had no effect on it. Neither of the drugs seemed to have any marked secondary action on the circulation, as enormous doses were given without any distinct alteration in either the blood-pressure or force of the pulse. In every case where the drug was pushed to a fatal result death was due to respiratory failure.

*Respiration.*—In moderate doses both drugs showed themselves to be powerful respiratory stimulants. It would seem that if hyoscine was present in sufficient quantity to have any part in the physiological action of scopolia, it would make itself manifest in the effect of that drug on respiration, as hyoscine is a respiratory depressant. But that scopolia is no whit less active than belladonna in stimulating respiration is shown by the following experiment: A dog weighing 6 2 kilos had a double tracheal cannula inserted, one end being connected with a Marey tambour. The respiratory rate was 36 per minute, the height of the waves recorded by the tambour being 4 millimeters. Two cubic centimeters of a five-per-cent solution of the alkaloids of scopolia, intravenously injected, caused an increase of rate to 96 per minute, the height of each breath wave becoming 16 millimeters.

*Dosage.*—There remains still one important point to be considered, namely, the comparative strength of the two drugs. Obviously the comparative strength of the crude drugs does not concern us here, as that depends largely on the percentage of active principles present, and is a pharmaceutical question. The point, however, of relative power of the alkaloids belongs clearly to this research. The evidence from outside, on this point, is so contradictory as to be of very little value. Thus Husemann* gives the dose of hyoscyamine as one to two milligrammes, and in a collective clinical investigation† the general consensus of opinion was that hyoscyamine should be given in doses of $\frac{1}{100}$ to $\frac{1}{25}$ of a grain. On the other hand, Shaw† uses it in ¼-grain doses. That the majority have not erred from excessive timidity is shown by the fact that $\frac{1}{40}$ grain has caused serious poisoning.‡ Evidently either the observers were using entirely different substances, or some samples contained large amounts of impurities. As evidence of this latter I cannot forbear referring to Merck's catalogue, where "Hyoscyamine, pure," is recommended in doses of ⅛ to ¼ grain and "Hyoscyamine, c. p.," in doses of $\frac{1}{130}$ to $\frac{1}{65}$.

As it is not a question of the absolute dose,

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*Husemann: Pflanzenstoffe.

†Seguin: *N. Y. Med. Rec.*, 1880.

‡Wood's Therapeutics, 1900, p. 187.

but of the comparative activity, of the two poisons, I have studied the evidence derived not only from experiments made upon mammals but also from batrachian studies.

In most of my experiments on frogs I have actually weighed the animal, but in a few I have adopted the almost universal but very unscientific method of guessing at the size of the frog. The word "medium" indicates a frog of 30 to 50 grammes weight.

| Drug. | Weight of frog. | Dose in grammes | Milligrammes per gramme of body weight. | Result. |
|---|---|---|---|---|
| Belladonna alkaloids. | Medium. | 0.02 | .... | No effect. |
| " " | Small. | 0.01 | .... | " |
| " " | Small. | 0.01 | .... | " |
| " " | 52 Gm. | 0 05 | 0.96 | Paralysis, with recovery. |
| " " | 37 Gm. | 0.05 | 1 35 | Paralysis, with recovery. |
| Atropine sulphate... | 44 Gm. | 0.20 | 4.34 | Death. |
| " " ... | 35 Gm. | 0.10 | 2.86 | " |
| Scopolia alkaloids... | Medium. | 0.0075 | .... | No effect. |
| " " ... | Medium. | 0.01 | .... | " |
| " " ... | 37 Gm. | 0.015 | 0.40 | Recovery. |
| " " ... | 55 Gm. | 0.02 | 0.36 | " |
| " " ... | 37 Gm. | 0 04 | 1.08 | Paralysis, with recovery. |
| " " ... | 33 Gm. | 0.08 | 2.42 | Death. |
| " " ... | 45 Gm. | 0 06 | 1.33 | " |

These experiments, although not numerous enough to bear very positive evidence, indicate that to the frog scopolia is slightly more poisonous than belladonna. Of far greater importance, however, is the study of the toxicity of the two drugs on mammals.

| Drug. | Weight of rabbit | Dose in grammes | Amount per kilo. | Result. |
|---|---|---|---|---|
| Belladonna alkaloids.. | 1.5 | 0.4 | 0.267 | Recovery. |
| " " .. | 2.1 | 0.6 | 0.286 | " |
| " " .. | 1.3 | 0 3 | 0.230 | " |
| Atropine sulphate..... | 0.85 | 1.10 | 1.294 | " |
| " " ..... | 0.84 | 0.8 | 0 952 | " |
| " " ..... | 0.72 | 0.9 | 1.250 | " |
| " " ..... | 0.8 | 1.8 | 2.25 | Death in 1¾ hours. |
| " " ..... | 0.7 | 1.5 | 2.143 | Death in about 1 hour. |
| " " ..... | 0 95 | 1 4 | 1.474 | Death in 12 minutes. |
| " " ..... | 1.0 | 1.5 | 1.5 | Death in 15 minutes. |
| Scopolia alkaloids..... | 1.9 | 0.3 | 0.158 | Recovery. |
| " " ..... | 1.5 | 0.4 | 0.267 | " |
| " " ..... | 1.1 | 0.4 | 0.364 | " |
| " " ..... | 1.8 | 0.8 | 0.444 | " |
| " " ..... | 1.6 | 1.10 | 0 687 | " |
| " " ..... | 0.9 | 1.20 | 1.333 | Death in half an hour. |
| " " ..... | 1 0 | 0 95 | 0.95 | Death in 45 minutes. |
| " " ..... | 1.2 | 1.0 | 0.833 | Death in about 1 hour. |

In a series of experiments made upon rabbits, given above in tabulated form, the minimum fatal dose of atropine sulphate for a rabbit was 1.474 grammes per kilo,* and the minimum fatal dose of the hydrochloride of the total alkaloids of scopolia was 0.833 gramme per kilo. In other words, the scopolia alkaloids are half again as active as the belladonna alkaloid.

CONCLUSIONS.

*Scopolia Carniolica* in its physiological action so closely resembles *Atropa Belladonna* as to be practically indistinguishable. Like belladonna, scopolia elevates the blood-pressure, paralyzes the pneumogastric nerve, is primarily a stimulant of the respiratory center, and in fatal dose kills by asphyxia. In the frog it is a paralyzant to the spinal cord and to Setschenow's center, and when brought in direct contact with a motor nerve lessens its function. The dominant alkaloids of the two plants, however, are probably not identical, since we find the scopolia apparently a little more depressant to the spinal cord, and distinctly more toxic.

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## *GASTRIC ULCER: ITS ETIOLOGY, SYMPTOMATOLOGY, AND DIAGNOSIS, WITH SPECIAL REFERENCE TO TREATMENT.*

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(*Continued from page 163.*)

*Symptomatology.*—A typical case of gastric ulcer presents very distinctive symptoms: these are localized, peculiar pain; vomiting; gastric hemorrhage, showing itself as more or less profuse hematemesis, or less often by the blood appearing only in the stools. There are also other digestive disturbances, such as those attending the frequently existing hyperchlorhydria. In a fair percentage of cases of gastric ulcer, in some of which the diagnosis is unfortunately enabled to be established through death by perforation, or in consequence of uncontrollable hemorrhage, or of an intercurrent disease, few or no symptoms have previously been known to exist by virtue of which recognition of ulcer was previously possible. Such cases are more or less familiar to every clinician of experience; these are spoken of as cases of latent gastric ulcer. Stoll, indeed, holds that as a result of the study of a large number of necropsy records of individuals whose life

*Fraser gives the minimum fatal dose of atropine for a rabbit as 1.0 gramme per kilo.

history was known, gastric ulcer may be latent in twenty-seven per cent of all cases. The writer's belief, however, is that few truly latent cases actually exist. It is the unfamiliarity of the general physician with the symptomatology of the less typical cases, and his lack of thoroughness in inquiry, that causes these to pass unsuspected. Quite recently the writer was asked to see a case in consultation in which there was recurring and alarming hematemesis. It was positively asserted that not only were no symptoms typical of ulcer obtainable, but that even ordinary dyspeptic symptoms had been absent. But a searching interrogation of the patient, in which leading questions were either avoided, or when by necessity introduced were so framed as not to allow the response to mislead, easily elicited a clear history of long existing hyperchlorhydria, with more recent change in the character of gastric discomfort indicating development of an element other than superacidity to account for the latter. There was also, though previously uncomplained of, the localized epigastric and dorsal pain and tenderness so suggestive. If the symptomatology of cases of so-called "dyspepsia," or what is now popularly called catarrh of the stomach, was more carefully and intelligently studied, fewer instances of latent ulcer would be found to exist. Before this can be intelligently done, the general practitioner must receive a more thorough training in the methods of gastric diagnosis. The writer has seen too many cases of ulcer, previously miscalled hysteria or a gastric neurosis, not to feel this strongly. The non recognition of ulcer often means death to the patient in a case the life of which could otherwise be spared.

During the early progress of the case, or in some subjects for a long period, little else than ordinary dyspeptic symptoms may be evidenced on casual inquiry. Since in the vast majority of cases hyperchlorhydria precedes the development of ulcer, or at least accompanies such development, the symptoms at first, as previously remarked, may be referable merely to heightened secretory activity. If ulcer is not yet present, or but in its incipiency, there is discomfort and even pronounced distress or pain, not immediately after meals, but occurring at a period in the digestion of food when saturation of the proteids and salts of the ingesta is more than complete and large excess of HCl appears as free (uncombined) acid. The discomfort or pain is then commonly dissipated by the ingestion of more food, or by an appropriate dose of an antacid. With the development of ulcer it will be noted that relief is no longer so afforded, and that pain appears early and is constant and of aggravated character. The patient frequently has gastric irritability, and vomiting becomes of common occurrence, especially after food and drink. In the vomit blood may be apparent, little altered in character, if the latter does not long sojourn in the stomach. In addition to the small hemorrhages, depending often upon the situation of the ulcer, more profuse hemorrhages may occur. These hemorrhages themselves induce vomiting. The vomit may be of blood alone, and then usually is of unaltered appearance and of more or less bright-red hue. Without actual hematemesis the stools will often from time to time show indication of blood, a profuse hemorrhage, through tolerance on the part of the stomach, sometimes only being actually so manifest, although previously suspected, by the sudden occurrence of prostration and, later, anemia. With or without evident gastric hemorrhage the patient emaciates. In many cases there is, previous to the development of ulcer, a chlorotic condition evident, with or without marked anemia. The appetite may have been capricious long before the development of ulcer. If the subject is a housemaid, the regular meals of a quality little suited to her gastric condition may have tended to develop this, as have her other forced, unhygienic habits. The appetite, if not at first markedly impaired, is apt soon to become so, a distaste for food being accentuated by the discomfort and pain induced by its ingestion. More imperfectly nourished as the ailment progresses, the chlorotic condition advances, and anemia, often at first only existing in a mild degree, augments; anemia is of course enhanced by the frequent occurrence of even slight oozing from the ulcer. The bowels are usually constipated, and the feces, if containing blood, are of characteristic color and of fetid odor. It must be remarked that small amounts of digested blood do not very perceptibly discolor the feces. There may be amenorrhea or actual suppression of the menses early in the case, so common in well developed chlorosis; or the menses may persist with an annoying tendency to menorrhagia, which further debilitates. When ulcer is of long standing there may be superadded to the chloroanemia an appearance very suggestive of the cachexia of malignant disease.

*Consideration of the Characteristic Symptoms.*—Pain is seldom if ever absent during the course of gastric ulcer, although it is not invariably of that character seen in typical cases, and may, in so-called latent ulcer, be unremarked for a long time. The cause of the pain is primarily the ulcer itself—the influence of the eroding process on the sensory nerve elements, bared and inflamed; of irritation of the sore by food and drink, and of the corrosive action of the secreted HCl. The pain may be contributed to by pressure on nerve filaments in the walls of the ulcer during attempts at cicatrization, and by localized peritonitis occurring at the site of adhesions. Pain may be present at all times or may be intermittent. It may be fixed or paroxysmal, but is commonly both, it usually is most intense immediately or soon after the ingestion of food and of drink, and is aggravated if chemical or thermal irritants are contained in the ingesta, or if the latter are highly spiced or of coarse nature. In many instances, however, even the blandest food or drink induces aggravation of the pain. This feature tends to separate the distress or actual pain that occurs in mere hyperchlorhydria, in which morbid sensations are usually markedly benefited or dissipated by the ingestion of food.

In ulcer pain is not only usually aggravated by food, but by the presence of the secreted HCl for the digestion of the latter. Very bland food, by combining with the acid, may temporarily, partially or even completely, relieve the pain of ulcer in cases in which excessive secretion of HCl exists. Solid food naturally causes more distress than liquid. Food or drink of extreme temperatures, or if highly spiced or acid, or containing alcohol, will likewise evoke distress. Pain may not occur at once succeeding the ingestion of food. Commonly it appears within a few minutes and increases in severity throughout the gastric digestive phase until the stomach empties itself into the bowel, or is emptied by emesis or by the use of the tube. Exceptionally pain may not be aggravated for an hour or two after taking food, but when this is the case, the suspicion should be entertained that the ulcer may be in the first part of the duodenum rather than in the stomach.

Posture often has a marked influence on the time of appearance and the duration and severity of pain. It has been suggested by this fact an idea of the situation of the ulcer may be ascertained. Relief, it is believed, can be afforded by removal of the contents of the stomach from the ulcer—the pain in ulcer situated near the pylorus being lessened by decubitus to the left; that of ulcer on the posterior wall by the prone position, etc. In ulcer, however, of any situation, save that toward the posterior wall, it is a matter of common observation that pain is usually less intense when the patient is in recumbency in dorsal decubitus. The erect posture and active exercise will generally greatly aggravate pain.

Pain is less intense and may often be absent when the stomach is empty, so that more comfort is felt during the night, and especially during the early morning hours. As a rule the better nourished the patient the less intense the pain; in conditions of physical and nervous debility it is usually most pronounced. The pain is commonly both localized and lancinating. The localized pain is apt to be present in a limited, small area in both the epigastric and dorsal regions. The epigastric site of pain is often local and is situated at a point immediately below, or not more than an inch or so below, the tip of the ensiform process, in an area which may be covered by a twenty-five cent or a dollar silver piece. Its area is often of greater extent, and may be the size of the palm of the hand or even larger. In this situation both spontaneous and provoked pain is more or less constant. Exquisite tenderness is apt to be present here to even light pressure, and deeper pressure, however gently applied, cannot be borne. In gastroptosis this localized area of exquisite tenderness may be, but is not usually, much lower than that cited. The dorsal fixed pain and tenderness is commonly placed immediately to the left of the eleventh and twelfth dorsal, or the first lumbar, vertebræ, and occupies an area about the extent of that described occurring in the epigastrium. Less often, but not uncommonly, the dorsal area of more or less fixed pain is on the right instead of the left, or may occupy both situations. Here, too, the pain is aggravated by even light pressure, but not to the same extent as it is in the epigastric pain. From these two situations, or from the epigastric center alone, should dorsal localized pain not be markedly present, the pain lancinates with paroxysmal exacerbations, induced or aggravated by the ingestion of food or drink. Often radiation occurs over the whole epigastrium and perhaps both hypochondria, through into the dorsal region, and it may be along nearly the whole spine and adjacent

dorsum. The pain is usually of pronounced burning character and is often at times paroxysmally unbearable. Radiation may occur through related sensitive nerves from the affected gastric filaments into those supplying other viscera and parts, and attacks simulating those of angina pectoris, with neuralgic pains in the left arm, may occur.

Pronounced hyperesthesia of the skin and subcutaneous tissues may accompany the epigastric, chest, upper abdominal, and dorsal pains. This is apt to be more evident on the left than on the right side. The pain may be reflected into branches of the vagus and induce spells of dyspnea. Extension may also occur into unusual paths, such as a branch of the phrenic. Such unusual persistent extensions of pain may indicate the formation of adhesions between the ulcer and an adjacent part. Adhesions to the liver may cause pain in the right shoulder.

The fixed pain is, as remarked, nearly always aggravated by pressure, however gently applied. So, too, pressure by the clothing is apt to much aggravate discomfort and pain. Women, as a rule, find they can no longer comfortably wear the corset. In so-called latent cases, and in a fair number of cases in which fixed pain is more or less constant, it may not be intensified by taking food or drink. In a small minority it may be then even less evident. Other symptoms are then necessary to establish the diagnosis, such as gastric hemorrhage.

*Vomiting.*—This, although very common in ulcer, does not occur with such invariability as the before discussed sign, and unprovoked vomiting may be entirely absent throughout the course of ulcer. The writer has often seen such cases. Of two cases recently studied, in one with history of ulcer of three years' duration unprovoked vomiting had occurred but twice. In the other, an ulcer of at least one year's duration, pain had not been complained of and vomiting had not occurred until provoked by an extensive gastric hemorrhage. The diagnosis was confirmed by exploratory operation. Vomiting, however, is usual in cases of ulcer, and is seldom absent throughout the course of the disease. It is commonly brought about by the irritating action of the ingesta and the superacid HCl secretion on the ulcer and on the hypersensitive stomach, and by the aggravation in pain so induced. Pylorospasm, leading to overdistention of the stomach, and to the accumulation of a superacid juice, is believed to be not infrequent in ulcer and to aggravate the paroxysmal pain present. Vomiting may occur immediately after the ingestion of food or drink, especially if these are of sufficiently irritating character to aggravate pain. As a rule, however, vomiting is less usual until after the lapse of half an hour to one or two hours. The character of the vomit in a case of suspected ulcer should be ascertained, and the presence or absence of blood looked for both macroscopically, microscopically, and chemically. Taking into account the occurrence of vomiting in relation to the character of food and the time of the ingestion of the latter, and whether alkalies have been administered, examination of the vomit should be made as to the amount of HCl, free and bound, present. This is especially necessary, since in many cases of ulcer, and chiefly those attended with hemorrhage, the stomach-tube should not be employed either for diagnostic or for therapeutic purposes save by one with large experience and discretion in its manipulations. The state of digestion of the food vomited should be ascertained, examination being also made for the approximate amount of the ferments, and, microscopically, for the persistent presence of erythrocytes, if blood has never been noted macroscopically, and for sarcinæ ventriculi, the last when there are indications of decided stagnation suggesting pyloric obstruction.

*Hemorrhage.*—Hematemesis occurs in about fifty per cent of all cases of gastric ulcer. When profuse, or when noted with some frequency, even when small amounts of blood are vomited, it furnishes the strongest possible evidence of ulcer. It is probable that ulcer never actually runs its course without at some period in its history at least concealed hemorrhage occurring. Such hemorrhage may often not be evident in the vomit. If vomiting is not a constant symptom, small hemorrhages, however frequently repeated, may alone manifest themselves by examination of the stool, and even with that done the blood may be undetected. It cannot be too strongly urged that although the occurrence of hematemesis is of the greatest value in the diagnosis of ulcer, the absence of vomiting of blood, or the absence of other indications of hemorrhage, should not be taken to indicate absence of ulcer in the presence of the characteristic pain and certain other symptoms. In a case that has been under observation now for over a year, with symptoms of ulcer of ten years' duration, the diagnosis of which was lately confirmed by

section, undertaken for resulting pyloric stenosis, and in which a large ulcer partially cicatrized was found in the usual situation, blood has never been noted by the patient in the vomit or stools, although always looked for in the former, and often in the latter. In this case vomiting was a daily symptom, until the patient came under the writer's observation.

With more or less characteristic pain, etc., stress may be laid on the more than isolated occurrence of even small quantities of blood in the vomit, especially if such is contained in that raised in the early part of the act of emesis, and it be certain that it has not come from the mouth or throat. In a certain class of neurotics, with irritable stomach, without other characteristic symptoms of ulcer, traces of blood may sometimes appear in the vomit, and even as much as from ten to thirty cubic centimeters may occur. A little blood is sometimes seen in cases with symptoms of mere gastritis, even when the stomach-tube is used most carefully. In such cases erosions are in all likelihood present which almost never proceed to ulcer. With a brief trial of Turck's revolving sound several years ago it was noted that small hemorrhages were invariably produced in nearly all cases in which it was tried and in which it was fairly certain that no ulcer existed. A rather free hemorrhage occurred as the result of its employment on but one occasion in a young woman in whom there had been no previous complaint of gastric pain. In these cases ulcer did not exist, but the mucous membrane of the stomach was probably in a hyperemic condition.

As concerns profuse hemorrhage occurring in hitherto unsuspected latent ulcer, the most notable case the writer has encountered was one seen in consultation with Dr. Eberhardt a few years ago. It was that of an intelligent young girl, aged twenty, in whom absolutely no present or previous history of gastric pain could be elicited, and in whom only very vague dyspeptic symptoms, not regarded by her as sufficient to deserve notice, had preceded, and yet so profuse a hematemesis occurred that life was for a time despaired of.

Physical exertion and the digestive act both favor the development of gastric hemorrhage in ulcer, as does emotional excitement. The menstrual period is also thought to favor gastric hemorrhage. That the introduction of the stomach-tube, by one unskilled in its manipulation, may induce hemorrhage in ulcer is to be ever borne in mind. The tube should always be employed with the very greatest caution in suspected ulcer, and should not be used if gastric hemorrhage has recently occurred. It is better that it should not be employed at all by the general physician in a suspected case of ulcer unless he is either familiar with its manipulation, or unless he first seek the judgment or cooperation of one who has had ample experience with its use. The danger is that of rupture of a large vessel and perhaps fatal hemorrhage, or of perforation of the ulcer itself.

The occurrence of extensive hemorrhage indicates rather deep ulceration and the opening of one of the large branches of the celiac axis. In hemorrhage not sufficient to excite immediate vomiting, the blood, altered in character by its surjoin in the stomach, may have the appearance of coffee-ground material. This habitually occurring in the vomit, or in the stomach contents removed through the tube, should excite suspicion of carcinoma rather than of ulcer.

The feces should always be carefully and systematically inspected, and further examined, both microscopically and chemically, if of suspicious appearance, in a case in which gastric or duodenal ulcer seems probable or possible It should be remembered that small quantities of blood that have undergone the process of digestion may not very perceptibly blacken the feces. With a hemorrhage of small quantity the feces may be merely of a chocolate color, suggesting an increase in the coloring matter of the bile. A larger hemorrhage tends to blacken the feces; and a hemorrhage of some size, especially if duodenal or if the blood be rapidly passed from the stomach into the bowel and thence on, through the increased peristalsis sometimes so excited, may make its appearance as characteristic little altered coagula. The feces containing blood from the stomach or upper bowel which has had the usual time in transit, is apt to be of a very fetid odor. Preparations of bismuth, of iron, or of tannic acid should not be administered in a case in which it is desired to examine the stools for the presence of altered blood. The occurrence of hemorrhage of any size causes the characteristic signs of shock. These may exist without the blood being vomited, and death may ensue rapidly from concealed bleeding. This, however, is very unusual.

Gastric hemorrhage should always be thought of and searched for in suspected ulcer in which rapid increase in anemia and otherwise unexplained physical prostration

and debility occur. In frank hemorrhage, the source of which appears to be gastric, after appropriate means being adopted to both check it and prevent its immediate recurrence, a searching examination must be made to ascertain its true source, should other symptoms of ulcer not be evident. The only other likely origin, in a person at an age at which aneurism is unusual, is the lung. A physical examination of the apices after danger of immediate recurrence is past, and a careful interrogation as to a history of cough especially on rising, of expectoration, and of night sweats, and the like, and a searching examination of a specimen of sputum intelligently obtained, will generally clearly demonstrate whether the source of the blood is pulmonary. It must not be forgotten that pulmonary tuberculosis and gastric ulcer may coexist, and the mere presence of the physical signs of the former would not necessarily indicate that the blood has come from the lung. Physical signs incident to recent hemoptysis should be sought for. The condition of the heart, as for mitral disease, and especially stenosis; of the thoracic blood-vessels for aneurism; of the liver for cirrhosis (here hematemesis may occur from esophageal varices)—should all be searchingly examined into. The presence of mitral disease does not of course exclude gastric ulcer. The coexistence of the two is not uncommon, and in gastric ulcer associated with uncompensated mitral disease hematemesis is usual.

*Condition of the Blood in Gastric Ulcer.*—As previously stated, chlorosis, or more ad vanced chloroanemia, often precedes the development of gastric ulcer. When this is the case there is naturally little or no improvement save under treatment directed not only to the healing of the ulcer, but to improving the state of the blood. The morbid condition of the blood becomes naturally much accentuated by virtue of the lessened intake of food, the vomiting, and gastric pain, incident to ulcer. Should hemorrhages occur, whether of any size, or if mere repeated small bleedings, anemia, if present, will naturally become aggravated. The blood-changes in a long-standing case, whatever the original condition, are those of a secondary anemia, more or less marked. Immediately after hemorrhage there is apt to be present, as is usual from hemorrhage in any situation, a transient mild pathological leucocytosis, with the appearance in the blood of nucleated erythrocytes, chiefly normoblasts. The resulting anemia may be of a very high grade. Recently, in a case of gastric ulcer under observation in the writer's wards at the Episcopal Hospital, in which a fatal issue eventually resulted from several very copious gastric hemorrhages occurring just before admittance to the wards, a leucocytosis was observed which a day or so before death was of extreme degree. The patient sank from sheer asthenia, despite every effort to revive her. Transfusion of blood and repeated daily infusions of large amounts of saline solution was practiced without more than temporary benefit. A large number of normoblasts was always present. The diminution in red cells was very marked.

Some hold that by a blood examination, the temporary appearance of a pathological leucocytosis, and of numerous normoblasts, and the appearance of augmentations in the already present chloroanemia, a diagnosis of concealed hemorrhage may be made. This statement is of more theoretical than practical value.

As might be expected, the normal digestive leucocytosis occurs in most cases of gastric ulcer.

*Other Symptoms of Gastric Ulcer.*—The occurrence of an increased percentage of HCl in the gastric juice has before been spoken of. This has usually preceded the development of ulcer, and is apt to be subsequently augmented even by the irritation caused by the presence of the latter. This hyperchlorhydria may be of only moderate grade, or very extensive. The total acidity may be upward of 150 or more after the Ewald trial meal—this acidity being nearly all due to free HCl and that loosely combined. With a high HCl acidity albuminoids should be promptly digested, but the transformation of the starches by aid of the incorporated saliva, or by ingested diastase, is much interfered with.

Later in the course of the disease, in the writer's experience, the hyperchlorhydria is less constant; there may be no increase over the normal, or the percentage may fall and remain persistently subnormal; or there may be a high percentage of acidity, due to fermentative changes in the ingesta and resulting development of organic acids. The writer has two cases of undoubted ulcer now under observation, in both of which, with a high total acidity, only a faint trace of HCl is present. Diminution in the secretion of HCl in these is due to the development of a gastritis, tending to cause atrophy of the gastric tubules. Rarely, as before mentioned,

total absence of the secretory functions is found.

The appetite is usually preserved in gastric ulcer save in long existing cases, in which cachexia is present. The patient commonly desires to eat, and may have an intense craving for food which can be little gratified because of the presence of pain and vomiting.

Gastric and intestinal flatulence are not uncommon in gastric ulcer, due either to a nervous influence, or to imperfect starch digestion with resulting neutralization of the pancreatic secretion, and often with destruction of the pancreatic ferments, through the action of the superacid gastric juice.

Pyrosis (or mere heartburn) is usual in these cases of hyperchlorhydria, and also in those of hyperacidity due to presence of organic acid.

There is nothing peculiar in the condition of the bowels in ulcer. If little food is taken and vomiting is usual, constipation is the rule. The tongue is commonly not markedly coated.

In cases with hyperchlorhydria, the urine shows the changes incident to that state—a tendency to low acidity or to a persistent alkalinity, with diminution in output of chlorides. The same may occur with normal gastric acidity when vomiting is frequent.

Fever is absent unless as a result of a complication.

Pain and vomiting, with hemorrhage, if long continued and more or less constant, originate a high grade of anemia and a dyscrasia which when unchecked eventually develops into a cachexia. The bodily emaciation and the hue of the skin may after a time suggest malignant disease, which in about five per cent of cases finally develops at the site of the ulcer or in its cicatrix.

In ulcer of long standing, through inflammatory thickening about its site, sometimes aided by the formation of adhesions to an adjacent organ or part, a tumor is evident on careful palpation, or even is noticeable on mere inspection. A cachexia present with this would naturally at first tend to suggest malignant disease. In a case before mentioned of long-standing ulcer near the pylorus, to which was adherent the adjacent portion of omentum, the tumor was of some size and caused the surgeon operating for the existing cicatricial pyloric stenosis to at first question the writer's diagnosis of chronic ulcer.

The size and shape of the stomach is unchanged in cases of uncomplicated gastric ulcer.

*Prognosis, Duration, Complications, and Consequences of Gastric Ulcer.*—Gastric ulcer is a disease which when encountered early is very amenable to treatment. The prognosis, however, under any circumstances must be guarded. The possibility of knowing with any exactness the situation and size of the ulcer; the likelihood of such complications resulting as erosion of a large vessel; of perforation, with its attending dangers; of such consequences as cicatricial stenosis of the pylorus; the frequency of relapse—should all render one cautious in hazarding an opinion as to ultimate recovery. It may at least be said that though gastric ulcer is a disease in itself and in its effects dangerous to life, with the intelligent cooperation of the patient the majority of cases may be cured and relapses prevented, if treatment, intelligently pursued, is begun sufficiently early, and that even in long-existing ulcer a cure may likewise be brought about, although such a consequence as adhesions crippling the function of the stomach, or the partial closure of the pylorus through cicatricial contraction, cannot be prevented.

According to Van Valzah and Nisbet, in fatally ending cases of ulcer death occurs in eighty per cent from perforation, in two per cent from profuse hemorrhage, and in about five per cent from such complications as hemorrhagic anemia, deformities of the stomach, and from inanition. These authors hold that if death from intercurrent disease (tuberculosis, cancer, etc.) be excluded, the mortality of the easily diagnosed cases is about one in seven.

The duration of a case of ulcer not under favorable treatment may be very prolonged if death does not occur in some such manner as above stated. In two cases recently under observation, it has existed twelve years. Many cases of longer standing are on record. Chronic ulcer is a disease in which relapses are very frequent after apparent complete cure. This is due to the fact that both the causes inducing ulcer and those continuing it cannot always be removed.

*Complications.*—Certain of these must again be briefly alluded to. The more common complications are perforative peritonitis and cicatricial pyloric stenosis. Less often seen are the development of carcinoma at the site of ulcer or about its cicatrix, and hour-glass cicatricial contraction of the stomach. Grave anemia simulating the progressive pernicious

type is also sometimes observed as a consequence of an untreated or ill-managed case.

*Diagnosis.*—The diagnosis of gastric ulcer is commonly not a matter of difficulty, save in a minority of cases. The characteristic pain, as described, especially that localized and intensified by pressure, with the presence of emaciation and with at least a moderate chloroanemia, renders the diagnosis very probable, even when vomiting is practically absent and gastric hemorrhage is not evident. The occurrence of hematemesis with the characteristic pain can leave little doubt, if care be taken to exclude gastric carcinoma. The reader is especially cautioned not to expect to encounter in each case all the typical symptoms, and to be on the watch for latent cases in which merely slight pain, occasional hemorrhage, and vomiting occur —cases that so often are regarded by the general practitioner as merely those of chronic dyspepsia. No other disease of the stomach except cancer can cause fixed pain, acutely intensified by pressure, and even in cancer pain of this sort is far less prominent than in ulcer. Cases in which merely mild dyspeptic symptoms are recognizable until a profuse hematemesis occurs must often remain undiagnosed for a long time. Many of these cases, however, are latent only in the mind of the careless physician. As before remarked, indications of hyperchlorhydria, with pain intensified by food, is very suggestive of ulcer.

To one acquainted with the manipulations of the stomach-tube and the methods of ascertaining by its aid the condition of the gastric functions, the separation of carcinoma from simple ulcer as a rule is easy, taking into account other important differences usually very manifest. The early absence of free HCl from the gastric secretion in cancer, with marked diminution in the amount of pepsin and lab enzymes, and the presence of the acids of fermentation, chiefly lactic, and with the latter the appearance of a special lactic-acid-producing bacillus (the Oppler-Boas), when the growth occupies the pylorus, as is usual; with the early impairment of the motor function—all tend to render the separation easy. This is often aided by the presence of recognizable tumor. The age, the family history, the common absence of preceding or accompanying hyperchlorhydria, or of other gastric disorder of long standing, the comparatively early appearance of cachexia and marked wasting, are all of help in the exclusion of simple ulcer. The appearance of the blood vomited is also of value. In carcinoma the hematemesis is nearly always of blood altered to resemble coffee-ground material, and the hemorrhage, unless from ulcerating carcinoma, is rarely of large amount. It must be remembered, however, that although the favorable time for cancer of the stomach is middle age or more advanced life (between forty and sixty), ulcer is not rare during at least the early part of this period, and that gastric carcinoma is now recognized to occur with more frequency than has been thought between twenty and forty.

The cancerous degeneration of chronic ulcer is far more difficult to recognize than simple carcinoma. Often the recognition can be but mere conjecture based on the ephemeral improvement in the symptoms under treatment that experience has shown is usually remarkably successful in the cure of ulcer. The improvement may at first be decided, but relapses recur seemingly causelessly; meanwhile the anemia and cachexia increase, and with advance in the carcinomatous process the appearance of altered blood in the vomit or removed contents is common, and may replace the frank hemorrhages, if such have previously occurred. The writer has seen two cases of carcinomatous degeneration of ulcer which he has followed to a fatal issue. In these such points as above detailed were of value in arriving at a diagnosis in life. Hyperchlorhydria if it has been present may persist for a long time. Its continuance as shown in one case studied by the writer was of no value in the exclusion of ulcer. In this case (see Transactions of the Association of American Physicians, vol. xiii, 1898, and the *American Journal of the Medical Sciences*, "A Case of Two Isolated Carcinomatous Gastric Ulcers") a very high percentage of free HCl was present after not only the simple Ewald trial meal, but after more complicated meals containing meat, a number of observations being made. Here eighteen months after a celiotomy which had shown the presence of gastric carcinoma, with omental metastasis, a meal of steak, bread, and milk was readily digested without pain, and the gastric filtrate at the height of digestion displayed remarkable proteolytic power. This patient presented a number of extraordinary features, indicating how curious the clinical history of certain cases of ulcer and gastric carcinoma may be. Hyperchlorhydria had apparently preceded the development of ulcer for sev-

eral years. Indications of engrafted carcinoma had preceded for perhaps a year a very rapid decline in health, which apparently but for an exploratory section would have promptly terminated life. Coffee-ground vomiting was then occurring and emaciation was extreme. A section by Dr. Keen disclosed the stomach too much involved by a presumed carcinoma for any radical measures to be taken Rapid and apparently complete recovery followed this simple celiotomy, and in a few months, with total disappearance of all symptoms, the patient weighed ten pounds more than ever before. Symptoms, excepting those of moderate hyperchlorhydria, remained absent for nearly one and a half years, and he was yet in fair condition, with fairly preserved weight, although steadily declining from the acme of health reached after operation when he came under observation at the end of eighteen months. Coffee-ground oozing recognized in the removed contents was at this time quite constant. Vomiting did not occur, and the rather severe fixed and radiating pains present were relieved by eating such hearty food as beefsteak, although aggravated by starchy food such as oatmeal. In this case two very large isolated ulcers, which had both undergone carcinomatous degeneration, were present.

In another case in which a diagnosis of carcinoma engrafted on ulcer had been made by the writer, and which subsequently succumbed to an operation for gastroenterostomy, there had been preceding hyperchlorhydria, succeeded by ulcer, and this by carcinomatous degeneration. Here only temporary improvement under treatment which the writer has found almost invariably successful in ulcer, a persistent tendency to relapse, with increasing anemia and cachexia, and the characteristic coffee-ground appearance of the blood in the removed stomach contents, rendered the diagnosis very probable. In this case, as motor power lessened, secretion of HCl gradually diminished until it became almost absent, with appearance of the acids of fermentation.

In carcinoma not engrafted on ulcer, and in which the gastric secretory and motor power early fail, there is almost invariably absence of a digestive leucocytosis. This absence, although not peculiar to carcinoma of the stomach, occurring as it does in any condition of the stomach which entails marked diminution in functional activity, is not usual in ulcer, and the preservation of a digestive leucocytosis in carcinomatous ulcer which has not yet materially interfered with the gastric functions may be looked for. A normal digestive leucocytosis was present in the first case of carcinomatous ulcer mentioned. A pathological leucocytosis is commonly present in gastric cancer, although the numerical increase in leucocytes is not usually nearly so large as in carcinoma outside of the stomach. A pathological leucocytosis does not occur in simple ulcer save as a result of some complication, or following hemorrhage. This point itself is of some value in diagnosis.

Gastric ulcer may be mistaken for chronic gastritis, especially that form characterized by hyperchlorhydria. Attention to the points laid down in the clinical description of ulcer will obviate error, especially if it be noted that (in ulcer) the pain is sharply localized, as described, and that there is also present lancinating, paroxysmal pain, both forms of pain being increased by albuminous food. When hematemesis also occurs the separation is very easy. The same is true as to the separation of simple gastralgia from gastric ulcer; the pain of the former is commonly lessened by food, and not markedly intensified by gentle pressure. It would have been desirable to discuss more in detail points of differential diagnosis, but lack of space forbids. However, attention to the clinical history of ulcer, as described, should suffice to arrive at a correct diagnosis.

(*To be concluded.*)

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## *THE MANAGEMENT OF ARRESTED POSTERIOR POSITIONS OF THE VERTEX.**

By Richard C. Norris, A.M., M.D.,
Surgeon in charge of the Preston Retreat, Philadelphia.

Coupled with the request to participate in the obstetric discussion to-night was one asking me to present a brief paper on some phase of forceps operations performed by general practitioners. Reviewing my consultation work during the past ten years, for the purpose of determining wherein the general practitioner as an obstetric surgeon has been most frequently at fault with the obstetric forceps, two facts stand out prominently which I have concluded briefly to discuss with you: (1) The technique of an aseptic forceps operation; (2) the manage-

*A paper read before the Philadelphia County Medical Society.

ment of persistent posterior positions of the vertex. The majority of men in general practice believe that they possess an accurate knowledge of surgical cleanliness. For their minor surgical work they doubtless do. A forceps delivery, however, is a major operation requiring as careful technique as an abdominal section. Let me briefly describe, therefore, the technique of a clean forceps delivery.

(*a*) Sterilization of the forceps, by boiling in water for at least ten minutes. In the absence of an approved sterilizer, the forceps may be wrapped in a towel and the blades immersed in the ordinary kitchen kettle for heating water. Soaking the instrument in any antiseptic solution cannot replace sterilization by boiling.

(*b*) The toilet of the patient. After emptying the bladder and bowel, the vulva, vaginal orifice, lower abdomen, and inner portions of the thighs should be scrubbed with soap and water and pledgets of cotton, and then thoroughly bathed with 1-to 2000 bichloride solution. The vagina should not be douched unless there is known to be present a virulent discharge, in which case the vagina must be subjected to the same vigorous scrubbing, after the patient has been anesthetized.

(*c*) The operator's hands should be scrubbed with nail brush, soap and water, for at least ten minutes, then scrubbed with alcohol and immersed for *three* minutes in a 1-to-1000 bichloride solution. The hands then are best covered with rubber gloves which have been boiled for ten minutes. I cannot too highly commend the use of rubber gloves by the general practitioner in his obstetric work; they will prove a safeguard against infection that he will soon learn to appreciate. A sheet folded to make an apron and suspended from the shoulders is a ready method of protecting the patient and the operator's clothing.

(*d*) The exact position and presentation of the fetus must next be determined by a careful examination, finding, if necessary, the ear of the fetus in order to make a cephalic application of the blades of the forceps, rather than a pelvic application — *i.e.*, the blades usually should be applied to the sides of the child's head and not in relation with the sides of the pelvis, regardless of the position of the head.

(*e*) Having properly adjusted the forceps care must be exercised to maintain strict cleanliness throughout the operation, which may be facilitated by frequently immersing the hands in an antiseptic solution and at intervals pouring the solution over the vulva and vaginal orifice.

(*f*) The head should be delivered through the vulvar ring with the forceps, using it to prevent a precipitous delivery. Lacerations extending up the lateral sulci of the vagina should always be repaired with stitches, placed in each sulcus of the vagina, the large curved needle making a deep sweep to insure catching the retracted torn edges of the levator muscles and of the fascia of the pelvic floor. Most general practitioners place a few stitches to close the so-called perineal body, and wholly disregard the vaginal lacerations, which are the really important ones. Silkworm gut or well chromicized catgut should be used. Vaginal douches thereafter are unnecessary and harmful. Signs of infection require prompt removal of the stitches and thorough disinfection of the torn surfaces. You will observe that the technique described is simple and readily carried out by one not specially trained to surgical work.

*Arrested Posterior Positions of the Vertex.*— Of the cases of delayed vertex labor to which I have been called as consultant, sixty-three per cent have been arrested posterior positions of the vertex, and, I regret to say, in very many instances the position had not been recognized, although efforts to deliver with forceps often had been made. So frequently have I observed this fact that I instinctively anticipate an undiscovered and arrested posterior position when I am summoned to bring my forceps, those of the doctor in attendance having failed, as announced in his note to me calling me to his assistance. The proper management of an arrested posterior position involves, first, an accurate diagnosis, and then the important fact that almost invariably insufficient flexion of the head is the cause of the delay. This incomplete flexion is usually the cause of the delay in advancement of the head, whether the head is movable above the pelvic brim or partially engaged at the pelvic inlet, or occupying the pelvic cavity, or rotated to the hollow of the sacrum and resting upon the floor of the pelvis. If *one remembers that flexion of the head must always be secured*, the management is wonderfully simplified, and practically all methods of treatment, except version, have that end in view, as an important part of the treatment.

It will be convenient to discuss the management of arrested posterior positions of the vertex in accordance with the degree of

the advancement of the head along the parturient canal, whether above the pelvic brim or occupying the pelvic cavity, or resting upon the pelvic floor. With the head above the pelvic brim a careful examination will find the head incompletely flexed, and we have to choose between four methods of treatment: First, external manipulation and posture of the patient to effect an anterior position of the vertex; secondly, internal manipulation combined with posture to obtain anterior rotation, followed by a high application of the forceps to effect engagement of the head in an anterior position; thirdly, the application of forceps to the head with the occiput posterior; and finally, podalic version.

As a matter of fact, external and internal manipulation and postural treatment in these cases rarely succeed, because the cause of the delayed labor is not recognized early and the conditions favorable to their successful employment — unruptured membranes, a dilated lower uterine segment, and relaxed vagina — are not present. When the os is rigid and the head is firmly grasped by the lower segment of the uterus, intra-uterine manipulation to secure dilatation and to rotate the head forward is an exceedingly difficult and dangerous operation in the hands of one unaccustomed to obstetric surgery. After anterior rotation has been secured, there is yet to be performed a difficult high forceps operation, so that from beginning to end the unskilled operator exposes the mother and the child to greater dangers than he would by at once resorting to podalic version. It is true, however, that version in these cases will be followed by a high fetal mortality, and in cases where labor has been prolonged, the membranes are ruptured, and the position of Bandle's ring is elevated, version must be discarded in favor of the forceps. It will thus be seen that in many cases we are forced to apply the forceps with the head above the pelvic brim and the occiput posterior to the transverse diameter of the pelvis. The question then naturally arises, shall we attempt to apply the blades to the sides of the child's head, or shall a pelvic application be made; or, failing to secure flexion and therefore failing to advance the head with the forceps, shall we attempt to secure flexion by the so called reverse forceps application, in which the blades are applied with the concavity of the pelvic curve looking downward, and tractions are thus made to pull the occiput down until the head is well flexed, when the forceps is removed and reapplied in the usual manner to the sides of the child's head, after it has entered the pelvis?

The disadvantages of applying the forceps to the sides of the child's head when the occiput is posterior to the transverse diameter, and the head is incompletely flexed and above the pelvic inlet, are, first, the extreme difficulty of such application because the sacral promontory encroaches upon the space where the posterior blade is placed, and secondly, when traction is attempted the instrument almost invariably slips and the tips of the blades approach the ears of the child, and if watchful care is not exercised, extension of the head will result rather than flexion. For those reasons, if the head is not engaged or is only partially engaged, despite the danger to the child's head the Tarnier axis traction forceps should be used, and the application should be the so-called pelvic application, in which the head is grasped somewhat obliquely. The operation of reversed forceps should only be attempted by the skilful operator, and in every case attempts should be made from time to time to push the forehead up and secure flexion during the intervals between tractions when the grasp of the forceps is relaxed. Having drawn the head through the pelvic inlet, the Tarnier forceps should be removed and the Simpson or Tucker forceps should then be applied to the sides of the child's head. With careful traction and gentle attempts at anterior rotation of the occiput, the head is finally brought to the pelvic floor and rotated to an anterior position, when again the forceps must be removed and reapplied to the sides of the child's head in order to complete the delivery.

Where flexion has been incomplete or the relative size of the head and pelvis is abnormally large or small, backward rotation of the occiput may have occurred, and the problem now is the management of the third class of cases, to which I especially wish to call your attention, namely, the occiput arrested in front of the sacrum. The use of forceps in these cases has usually been that of a tractor. Most authors in discussing this question have condemned the use of the forceps as a rotator, pointing out as dangers of the latter operation the excessive twisting of the child's neck without corresponding rotation of its trunk, and extensive laceration of the vaginal wall. Guided and warned by such advice, it has only been within the last two years that I have attempted anterior rotation of the occiput from the hollow of the sacrum by means

of the forceps. I was influenced to attempt this operation as routine practice, from my experience with the dangers to the child and to the maternal soft parts, especially in primigravidæ, when delivery has been accomplished by overflexing the head and then extending it as the occiput cleared the vulvar ring. When anterior rotation is effected with a solid-bladed instrument, the operation slowly and deliberately performed before the soft parts have become edematous from delayed labor, and when we have made the conditions favorable by bringing the vertex to the vulvar outlet, by being sure that the cervix is fully dilated, the bladder and rectum empty, and, most important of all, that the head is flexed as much as possible—in the presence of these conditions, which are of our own making, I have repeatedly performed the operation without producing extensive laceration, and with as good, if not better, results for the child. The forceps with solid blades, such as Tucker's, is less liable to slip, not so apt during rotation to make incised wounds on the child's scalp and face, and by exercising sufficient care to *keep the tips of the blades always in the axis of the pelvic canal*, as I shall demonstrate on the mannikin, extensive laceration of the vaginal walls will not occur. Repeated examinations should be made to note the progress of rotation by studying the changing position of the sagittal suture. After this suture has been rotated in front of the transverse diameter of the pelvis, the head should be held in this position until several uterine contractions and relaxations have occurred, and abdominal manipulations must be carefully practiced to secure anterior rotation of the trunk, thus avoiding injury to the child's neck. One must be *very sure* that such rotation of the trunk has occurred before proceeding to reapply the forceps to the anterior position of the occiput in order to complete the delivery in the usual manner.

I shall only refer to the application of reversed forceps for rotating a posterior occiput in order to condemn it. In the hands of even an expert operator this operation is attended with dangers that far outweigh its only advantage, namely, the completion of the delivery without the necessity for reapplying the forceps after rotation has occurred. Reapplication of the forceps has a distinct advantage for the child, in that the head is grasped at a different place, compression is relieved, and threatened asphyxia is frequently prevented; and, therefore, the reapplication is always to be preferred. When the head fails to rotate anteriorly unless great force is employed, as usually will not be the case, it is best to abandon attempts at rotation and deliver the head with the occiput posterior, bearing in mind the necessity for elevating the handles to produce overflexion of the head and then to depress the handles, thus delivering the face under the pubic arch after the occiput has cleared the vulvar ring.

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## *HYDROCELE AND ITS TREATMENT; SUMMARY OF 338 OPERATIONS; DESCRIPTION OF A NEW METHOD SUGGESTED BY DOYEN FOR THE RADICAL CURE OF HYDROCELE OF THE TUNICA VAGINALIS TESTIS.*

By Orville Horwitz, B.S., M.D.,
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After having investigated the literature of hydrocele the surgeon will be astonished to find how many methods of treatment have been suggested for the radical cure of the disease. Want of space and time will prevent my doing more than taking up for consideration those methods only which are in vogue at the present time, and have proved to be of value. That chronic hydrocele is rebellious to treatment is patent to any one who has had much experience with the disease; this, too, is shown by the extraordinary number of expedients which have been recommended for its relief. At the present time there are five different methods of treatment employed with a view to effecting a radical cure. They are: (1) Acupuncture (for infantile hydrocele); (2) tapping and injecting with irritating substances; (3) antiseptic incision; (4) incision, with partial excision of the sac; (5) incision, with eversion of the tunica vaginalis testis.

Cases where spontaneous cure has unexpectedly taken place have been occasionally observed, notably by Terrillon and M. M. Monod. I have had a similar experience with a patient who was referred to me several years ago by Dr. Joseph Price, of this city. The individual had an ordinary hydrocele of the left side containing about eight fluidounces; it had made its appearance one year before I first saw the case. I suggested a radical operation, to which the patient consented, but stated that business affairs made

it necessary for him to postpone surgical interference for at least three months. Soon after, to my surprise, the tumor began gradually to diminish, and at the end of a month it had completely disappeared. A spontaneous cure may be looked for in some instances where there has been an inflammatory condition of the scrotum following traumatism, epididymitis, orchitis, or erysipelas. A case is reported where absorption of the fluid took place after a sharp attack of gout, and another after recovery from smallpox. This fortunate and much-to-be-desired result is unfortunately so rare as not to be regarded as one of the probable terminations of the malady.

I am indebted to one of my clinical assistants, Dr. Henry Tucker, for arranging the following table from the operating book of the genito urinary department of the Jefferson Medical College Hospital. The table gives the number and character of cases operated upon from 1894 to 1901.

| | |
|---|---|
| Hydrocele, congenital (resection and ligation of fornicularform process) | 2 |
| " diffused of cord | 2 |
| " double (resection of both sacs) | 19 |
| " ("en bassac") | 1 |
| " encysted of cord (resection of sac) | 17 |
| " encysted of cord, with hernia (radical cure of both) | 1 |
| " encysted of epididymis (resection of sac). | 7 |
| " encysted of tunica albuginea | 5 |
| " (spermatic cyst) | 1 |
| " infantile (antiseptic incision) | 9 |
| " (needle operation) | 25 |
| " inguinal (castration and resection of sac). | 3 |
| " inguinal, complicated with hernia (castration, resection of sac, and radical cure of hernia) | 4 |
| " (resection of sac, transplantation of misplaced testicle, and radical cure of hernia) | 2 |
| " multilocular | 1 |
| " obliterated hernial sac | 2 |
| " tunica vaginalis (antiseptic incision) | 25 |
| " " " double (antiseptic incision, both sacs) | 8 |
| " " " and encysted of cord | 8 |
| " " " inguinal hernia (radical cure of both) | 9 |
| " " " (resection of sac) | 94 |
| " " " inversion of tunic | 8 |
| " " " (tapping, palliative operation) | 84 |
| " " " with encysted hydrocele of epididymis | 1 |

On consulting this table it will be seen that three hundred and thirty-eight operations were performed for the relief of the various known forms of hydrocele, some of which were very rare and of unusual interest. No deaths resulted from any of the operations. The cases treated included all ages, from infants a few weeks old up to septuagenarians. This would seem to show that with proper antiseptic precautions the dangers attending the various methods of operation for hydrocele are slight. The patients who were treated by the method known as "antiseptic incision" usually left the hospital on the sixth day, whilst those whose sac was partially resected were able to leave the institution on the ninth day.

Thirty-four of the cases were infants who were operated upon by the method known as the "needle operation," or "acupuncture." Of this number nine cases recurred and were again operated upon, antiseptic incision being employed in the second instance. In two out of the nine cases so treated recurrence took place, and in each instance the sacs had to be partially resected before a cure was effected. Thirty-four adults were operated upon by the method known as "antiseptic incision," of which number the hydrocele was double in eight cases. So far as we have any record, recurrence took place in nine cases, rendering another operation necessary. Partial resection of the sac was performed in ninety-four cases; in two instances, the hydrocele being double, both sides were operated upon at the same time. Recurrence has been known to take place in but one case. In performing the needle operation in infants it was found that acupuncture had to be performed from four to six times at intervals of once a week until a cure was secured. The antiseptic incision was reserved for diminutive cases, where the sacs were thin, and had not been tapped, or injected with irritating substances; the sac being limited to the scrotum and not extending up into the inguinal canal. For the past two years this operation has been performed by cocaine infiltration anesthesia, a one-per-cent solution being employed. Out of the number operated upon, recurrence took place in nine cases. The number of cases in which relapses occurred is possibly larger than that named, as it is probable if recurrence did take place the individuals were either in different parts of the country or had sought relief elsewhere. From the results obtained from this operation, whilst it is safe and easily performed, it does not appear to be very reliable. Its usefulness seems to be limited to small recent hydroceles, with thin sacs, which have been neither tapped nor injected. Tapping or injecting with either iodine or carbolic acid had been performed in six of the cases which have been reported previous to making the anti-

septic incision, and even after the latter operation had been accomplished four of the cases so treated recurred. This operation was employed by me before I had an extended experience with the radical treatment of hydrocele. In later years I have partially resected the sac in well-nigh every instance.

The cases selected for partial excision of the sac were those where the amount of fluid was large, which had extended upward into the inguinal canal, and which had been previously treated by means of injection of irritating substances. The mode of operating employed differed somewhat from that recommended in the text-books. An incision was made over the tumor dividing the tissues down to the sac, taking care not to open the tunica vaginalis, which was dissected entirely free from the adjacent textures and brought out through the incision in the skin. The sac was then opened throughout its entire length and trimmed away with scissors; the portion covering the cord was mopped off with pure carbolic acid. If hemorrhage from the cut margin of the sac proved troublesome, it was controlled by means of a continuous catgut suture applied along both edges of the divided tunic. The wound was then closed in the usual manner, and a small quantity of iodoform gauze was left in the dependent portion of the incision for the purpose of drainage; this was removed at the end of twenty-four hours.

The method of treatment here described has proved most satisfactory. As far as is known recurrence has taken place in but one instance. Return is less liable to take place after this operation than after any other hitherto suggested. It is the most extensive and severe of any of the methods that have been employed up to this time; hemorrhage is sometimes troublesome if the sac is very thick and has been repeatedly tapped, or if it has been injected with carbolic acid. Out of the ninety-four cases so treated, fifteen had been repeatedly tapped and eighteen had submitted to the injection of stimulating substances, resulting unsuccessfully. In eighty-four cases the palliative treatment was employed. This consists in simply evacuating the fluid contents of the sac by means of a trocar and cannula, or by the use of an aspirating needle. This method of treatment was reserved for patients who were very far advanced in years or suffered from some chronic disease of the heart, lungs, or kidney. For the purpose of tapping a hydrocele most surgeons employ a trocar and cannula designed for the purpose. I have found that an aspirating needle about the circumference of No. 9 M. (French scale) is preferable, as the sight of a small needle gives rise to less fear in the timid individuals than does that of the trocar; it is inserted with less pain, the wound inflicted in the scrotal tissue is much smaller, and consequently there is less danger of infection. I have employed both instruments in numerous cases, and have found the needle to be the more satisfactory.

It will be observed that none of the cases reported were treated by tapping and injecting irritating substances into the sac. The late Prof. S. D. Gross advocated the use of tincture of iodine as an injection, and Dr. R. J. Levis was the first to suggest the employment of carbolic acid. As clinical assistant to both these gentlemen I had abundant opportunity to witness the results obtained from the use of these fluids. In the majority of the cases when the tincture of iodine was employed the termination was extremely unsatisfactory. Its use was usually attended by a prolonged convalescence, the patient often being confined to his bed from ten to fifteen days; in many cases two or three months elapsed before the surgeon knew definitely whether or not a cure would be effected. Immediately after the injection of either tincture of iodine or carbolic acid the sac became enormously distended and was usually attended with a great deal of pain. In many cases relapses occurred. Jacobson states that "in twenty-five cases so treated at St. Thomas's Hospital recurrence took place in eighteen." Of nineteen cases treated by Bardelelon, but sixty-five per cent were cured. Jacobson estimates the recurrence in our climate from this method of treatment to be about ten per cent. In my experience this is rather a low estimate. Extensive edema of the scrotal tissues has been reported following the escape of either tincture of iodine or carbolic acid into the structures. Suppuration of the sac, abscess of the testicles, and carbolic acid poisoning have all been noted. In one case, treated by means of carbolic acid injection, abscess of the testicle followed, involving the cord, giving rise to a lymphangitis; death finally taking place from sepsis. The only thing which commends tapping and injecting a hydrocele sac is the fact that it is readily and rapidly performed. The objections to tapping and injecting for hydrocele are so numerous that most surgeons now resort to the open operation; it is far safer and less

painful, with quicker convalescence, and a diminished liability to recurrence.

It will be observed that the treatment employed in the cases here recounted was not entirely satisfactory. The method which uniformly gave the best results was when the sac was partially resected. This operation required an anesthetic, took some time to perform, the operation frequently being prolonged in order to give attention to controlling the annoying hemorrhage that supervened. About nine days was required for convalescence; after which there was no certainty that a recurrence would not take place. The profession is therefore still in a position to adopt with cordiality any new method of treating this affection that will take less time in its performance, that will be attended with less pain, and be followed by a greater certainty of a radical cure. It is believed that an operation which fulfils these indications has at last been devised and is so simple that the wonder is that it had not been thought of before.

In 1898 Winkelman published in the *Centralblatt f. Chirurgie* (No. 44, p. 1092) a description of a new method of operating on ordinary chronic hydroceles, which seems to answer all requirements and solve the vexed question as to what may be the most practicable. The operation is performed under local anesthesia, Schleich's infiltration method being employed. The ordinary incision is made through the scrotal tissue until the tunica vaginalis is reached. An opening is then made in the upper portion of the sac in the vicinity of the cord, large enough to permit the testicle to be drawn through, after the fluid is evacuated, when the tunica vaginalis propria is turned back, or everted. In order to prevent the testicle from slipping back into the sac, the upper part of the tunica vaginalis is secured by means of fine catgut to the fascia of the cord, a suture being at the same time placed at the lower end of the repleted tunica, thereby anchoring the tunic in its new position and preventing the testicle from returning to its normal position. The testicle together with the inverted sac is then replaced within the scrotum, and the wound closed by means of a couple of interrupted sutures. The time employed for the operation is less than ten minutes. As it is not attended by hemorrhage no ligatures are needed.

When studying the subject of hydrocele I found that a precisely similar operation to that of Winkelman had been previously described by E. Doyen, of Reims, France, in the *Archives Provinceales de Chirurgie* (tome iv, No. 2, p. 706, 1895), under the title of "Radical Cure of Hydrocele by Inversion of the Tunica Vaginalis," thus antedating the publication of Winkelman by three years, so that it appears the credit of first suggesting this process belongs to Doyen and should receive his name.

I am under the impression that this operation was first performed in this country by Prof. W. W. Keen at the surgical clinic at the Jefferson Hospital on January 16 of the current year. In the minutes of the case it is noted: "The operation required less than ten minutes to perform. No ligature was required. The highest temperature reached was 99.2°. The patient left the institution on the twelfth day, cured."

Since witnessing the operation here referred to I have had the opportunity of performing it eight times. My experience in each instance has been similar to that of Dr. Keen. The largest hydrocele contained one and a half pints of fluid. In each case the time required for the performance of the operation was about nine minutes. No ligature was required, and the patients were enabled to leave the hospital on the ninth day.

In large hydroceles of long standing, with greatly thickened sacs, the operation would not be feasible, and the partial resection of the tunic would have to be resorted to. This is illustrated by a case that came under my care one week ago. The individual was a mounted policeman who stated that two years ago he struck his scrotum against the pommel of his saddle, and in consequence a hydrocele was developed; that two weeks before presenting himself at the hospital he had knocked the tumor violently against the corner of an ash box, when it became very much enlarged and painful, and at the same time turned "as black as his shoe." On opening the sac a pint and a half of serum mixed with blood and bloody clot was evacuated. The sac was thickened to the extent of about one-quarter of an inch, and it was firmly adherent to the surrounding tissues. It was dissected loose with difficulty. The thickness of the tunica in this instance would have rendered inversion an impossibility. It is interesting to note that the cause of the hematocele was found to be due to a rupture of the tunica vaginalis propria about two and a half inches in length at the bottom of the sac, directly opposite the point at which the blow had been inflicted.

In all the cases operated upon by inversion of the tunica vaginalis a painless enlargement of the testicle resulted; it was, however, not attended with any rise of temperature, and it gradually subsided in about ten days. This condition is precisely similar to that which always follows the open operation for hydrocele. The first case operated upon by me, on January 18 last, was seen two days ago. The individual was perfectly well, and a trace of the operation was detected only by making a careful examination.

This new operation is still on trial. My experience is too recent for me to determine whether a recurrence of the ailment may or may not take place in any of the cases that have been under my supervision. From the fact that the inverted tunica vaginalis must become attached to the surrounding structures, and the cavity formed by this sac is thus permanently obliterated, it would look as if a recurrence of the condition would be an impossibility. The removal of the entire tunica vaginalis, except a small strip covering the cord, in ninety-four cases has convinced me that no fear need be entertained as to the result of injury to the testicle by being deprived of its natural covering.

My limited experience with this new method of treatment inclines me to the belief that it will prove to be the most satisfactory operation which as yet has been suggested for the radical cure of an ordinary chronic hydrocele.

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### *THE TREATMENT OF SIMPLE AND COMPLICATED FRACTURES.*

DUPLAY (*Annales de Chirurgie et d'Orthopédie*, No. 12, 1900), after calling attention to the three cardinal indications in the treatment of fracture of the leg—namely, reduction, retention until complete consolidation, and subsequent oversight until the limb becomes entirely functional—advises in effecting a reduction that the thigh be flexed on the trunk and the leg flexed on the thigh, the foot being held in extension, thus relaxing all the muscles. The limb having been thus placed, an assistant, by means of his two hands locked together, exercises counter-extension upon the thigh beneath its flexor surface just above the popliteal space, while a second assistant, seizing with one hand the back of the heel, with the other the dorsal aspect, makes extension. The surgeon himself then coapts the bones by means of direct pressure. Reduction once having been obtained, it is best maintained by a plaster-of-Paris bandage; the bones being held in proper position until this has completely hardened.

In simple fractures this plaster is allowed to remain without being renewed for forty-five days in the case of an adult; for a somewhat shorter period in the case of a child. If the fractures are complicated by extensive contusion, with great swelling due to blood infiltration, and the formation of vesicles upon the skin, reduction should be maintained by a plaster-of-Paris splint molded to the part, and so applied that it is made up of two hinged portions. A layer of cotton is interposed between the surface and the splint, which is closed with moderate pressure. This splint is renewed as it becomes soiled by the breaking of the phlyctenulæ, or as it becomes too large from diminution of the swelling. When the fracture is complicated by wounds, a molded wire splint is serviceable; this is replaced by the plaster of Paris when the wound is sufficiently healed. The blisters which are raised upon the skin surface, and which are sometimes enormous, should be opened by a pair of scissors. An antiseptic powder should then be dusted on the skin, which should be protected by a layer of cotton, after which the plaster of Paris should be applied if there be no other complication.

When muscular spasm appears, and this is particularly likely to occur in drunkards, an anesthetic should be given and should be maintained until the fracture has been reduced and has been retained by the thoroughly hardened plaster.

Some fractures, even under anesthesia, are irreducible, either because of the multiplicity of the fragments, or because they are wedged, or because of the interposition of a displaced fragment.

A fracture is said to be incoercible when it can be reduced, but the deformity recurs the moment that the pressure and retraction used to accomplish reduction cease; this is usually due to the extreme obliquity of the line of fracture. Under such circumstances continued extension may be desirable, applied by means of weights secured to the limb by adhesive plaster. When this means seems inoperative, the molded splint aided by direct pressure applied to the projecting fragment has sometimes proved satisfactory.

When the fracture in spite of every form of dressing remains either irreducible or incoercible, the seat of injury should be laid bare by incision, and the bone should be secured by suture.

# The Therapeutic Gazette

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SUBSCRIPTION RATES FOR 1901.
(PAYABLE IN ADVANCE.)

THERAPEUTIC GAZETTE (*postage included*).....$2.00
THERAPEUTIC GAZETTE with MEDICAL AGE..... 2.50
THERAPEUTIC GAZETTE with BULLETIN OF PHARMACY..... 2.50
THERAPEUTIC GAZETTE with MEDICINE..... 3.25
THERAPEUTIC GAZETTE with AGE and MEDICINE. 4.00

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Price to Foreign Subscribers direct (postage included), $2.50 (10 shillings). English postage-stamps received on remittances.

Editorial communications should be addressed 222 South Fifteenth Street, Philadelphia. Articles intended for the Original Department of the GAZETTE will be accepted only with the understanding that they are contributed to it exclusively.

Authors will receive reprints in pamphlet form, without charge, provided the request for them be written on the articles sent.

Business communications should be addressed to

**WILLIAM M. WARREN, Publisher,**
Box 484. DETROIT, MICH.


## Leading Articles.

### *SOME POINTS IN THE TREATMENT OF RHEUMATIC FEVER.*

We have from time to time, in the editorial pages of the THERAPEUTIC GAZETTE, expressed our views as to the value of the salicylates, the iodides, and *rest* in the treatment of acute articular rheumatism, and the readers of the GAZETTE may remember one particular editorial about a year ago in which we called attention to the emphasis lately laid upon the value of rest, for the purpose of curing incipient heart lesions due to rheumatic endocarditis, by Sir Douglas Powell, physician in ordinary to her late majesty, the Queen. It will be remembered that Sir Douglas showed very distinctly that rheumatic patients who left their bed too early after the subsidence of the fever were far more apt to develop, later on, permanent manifestations of valvular disease than those who were forced to remain quiet in bed for a period of several weeks after all joint manifestations had passed away. We have again and again been able to verify this very important clinical and therapeutic fact, and we now have in mind several cases seen within the last twelve months which illustrated the advantage of rest very strongly. In two of these cases the patients insisted upon getting up and going about within a week after the subsidence of the fever, and the disappearance of general manifestations. In both of them chronic and apparently increasing valvular deformity is taking place. In two other cases, on the other hand, who seemed to be in a much more unfavorable condition, so far as ultimate recovery was concerned, complete cardiac recovery has apparently taken place. In one of these cases a man of advanced years had a very distinct mitral regurgitant murmur, and was not allowed to leave his bed until this murmur disappeared. Since that time he has been able to do as much work as before he was taken ill, and we feel confident that had he been allowed to go about too early this lesion would not only have become permanent but probably have been progressive and greatly shortened his life.

Another method of treatment connected with the cardiac manifestations of the rheumatic poison which has been mentioned a good deal within the last few months, and to which we have drawn attention in the columns of the GAZETTE, is that which has been advocated chiefly by Caton, of England, who claims that the frequent application of small fly-blisters over the precordium during the course of rheumatic fever does much toward preventing serious valvular endocarditis. The statistics which Caton publishes are certainly very extraordinary; indeed, they are so favorable that we cannot help believing that he has been unusually successful with the cases which have happened to come to his hand; for so far as we know, no one else has approached such good results by any method of treatment which has been instituted, and we fear that a larger series of cases will show that the method is not all that Dr. Caton believes it to be. Nevertheless, it seems to have produced clinical results which are well worthy of our consideration, and we would suggest that the method be thoroughly employed.

A rheumatic endocarditis having once been established during the acute course of the disease, the question arises what can best be done for it. In this connection it must be remembered that the rheumatic poison is not only capable of causing serious lesions in the valve, but also of affecting the heart muscle as well; and the presence of fever combined with these facts would seem to

indicate that digitalis can hardly be expected to exert its good effect upon the heart muscle under these circumstances, but that on the other hand moderate doses of strychnine and the use of ammonium carbonate are probably the best cardiac stimulants for ordinary purposes. In this connection we should not forget the very great value of opium and morphine in endocarditis, myocarditis, and pericarditis; for not only do these drugs give relief from the pain and suffering, but they diminish the patient's anxiety, quiet his restlessness, and slow the pulse by allaying nervousness and by direct action upon the circulatory apparatus. This question of slowing the heart does not, we think, receive sufficient attention. When we consider that a difference of ten beats a minute mounts up to 600 beats per hour and 14,400 beats a day, we can readily see that what may seem to be comparatively slight variations in pulse-rate may mean very great variations in the amount of work put out by the heart muscle in twenty-four hours. This is also a valuable point to remember in connection with the development of pericarditis, for there can be no doubt that the slowing of the heart rate, which prevents the two surfaces of the pericardium from being rubbed together, very frequently is distinctly disadvantageous. For this purpose, also, Luff has recommended that from eight to twelve leeches be placed over the heart, and after they have been removed an ice-bag applied; the leeches, it is asserted, giving speedy relief to the cardiac distress, and the ice-bag allaying pain and discomfort.

Another point which is emphasized very strongly by Luff in an article recently contributed to the *London Practitioner* is the valuable results which are to be obtained by combining the salicyl compound with an alkaline bicarbonate. He states that twenty grains of sodium salicylate and thirty grains of potassium bicarbonate should be given every two hours until the rheumatic pains in the joints are relieved, when the same quantity should be given every four hours until the temperature has fallen to normal. After this, fifteen grains of the salicylate and twenty grains of the bicarbonate are to be given every twenty-four hours until all joint symptoms disappear, and then three or four times a day until a fortnight has elapsed after the complete disappearance of the joint symptoms. The salicylate is to be administered cautiously and not haphazard, and if it causes deafness, great fulness of the head, and delirium, its dose should be reduced, or it should be withdrawn. The cerebral symptoms can now and then be avoided by giving a dose of calomel followed by a saline purgative. It seems to be the general opinion of English physicians that salicin is less depressing to the nervous symptoms and the heart than salicylate of sodium, more apt to be pure, and almost equally valuable so far as the rheumatic poison is concerned. In a part of his valuable article dealing with this subject in the *London Practitioner*, Luff makes the following remarks in regard to the treatment of rheumatic fever by the use of alkalies:

"The treatment of rheumatic fever by alkalies, which was first advocated by Fuller, was originally adopted on account of the view that an excessive production of lactic acid was the causative factor of the disease. Such a view is not now held, but it is probable that a diminished alkalinity of the blood is associated with rheumatic fever, and that along with this diminished alkalinity hyperfibrinosis of the blood occurs. If such be the case the advantages of treatment by alkalies are obvious, especially if the removal of the hyperfibrinosis does away with or diminishes the liability to fibrinous deposits on the valves of the heart. It has for some time been the opinion of many observers that heart complications are less frequent among those patients who have been treated with alkalies, and this has been ascribed to the influence of those substances in preventing the coagulation of fibrin. Other observers have insisted that valvular affections of the heart are less frequent when alkalies are employed in combination with salicylates than when salicylates alone are used. From the statistics of 224 cases of rheumatic fever admitted into St. George's Hospital without any affection of the heart, part of whom were treated with salicylate together with alkalies, and part with the salicylate alone, of those treated with salicylate and alkalies not quite two per cent developed endocardial murmurs while under that treatment, whereas of those treated with salicylate alone 9.6 per cent developed endocarditis or pericarditis while under treatment. If these views as to the usefulness of alkalies are correct, then the conjoint employment of a salicylate with an alkali in the treatment of rheumatic fever is obvious, the salicylate acting by diminishing the fever and the arthritic pain, and the alkali by averting or diminishing the tendency to endocarditis. Douglas Powell regards the usefulness of

alkalies rather as increasing the oxidation of the tissues and promoting the elimination of morbid materials."

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### *THE USE OF ATROPINE TO AFFECT THE INTESTINES.*

There can be no doubt that the profession is in need of some medicinal substance which when given hypodermically will produce evacuation of the bowels, for conditions are frequently met with in which because of gastric irritability it is impossible to administer the purgative by the mouth, and ordinary rectal injections to unload the upper portion of the bowels are not always possible because irritability or inflammation of the bowel prohibits any attempt to produce a movement by introducing medicinal substances into the rectum. For this reason, from time to time, various drugs have been studied with the hope that they might be introduced hypodermically and affect the intestine, but practically none of them have been found to be of any value. It is true that Ostermaier, Batsch, and others have attempted the treatment of intestinal obstruction by the use of large doses of atropine with the hope that this drug by depressing the inhibitory fibers of the splanchnic nerves might produce active peristalsis, or on the other hand, by overcoming muscular spasm would permit peristaltic movement to take place. Thus Ostermaier has used these injections of atropine in the intestinal inactivity associated with hepatic or renal colic, movable kidney, and other conditions where laxatives have failed. He found that atropine was usually successful in producing a copious fecal evacuation in from twelve to thirty six hours, and that if it failed to act in this manner a very small dose of castor oil, or some other purgative, was efficacious. He further suggests that atropine be employed hypodermically to overcome the intestinal feebleness or inactivity following severe abdominal operations.

Other investigators, notably Raviart, have stated that the hypodermic injection of the hydrochloride of apocodein, an artificial alkaloid derived from codeine in much the same manner as is apomorphine from morphine, was capable of producing active peristaltic movement.

The medical profession have of course for many years recognized the fact that the administration of morphine and atropine was capable of producing active peristalsis in certain cases; notably, in instances of obstinate constipation of the bowels due to chronic lead poisoning. In these cases it has been found that the administration of ordinary purgatives is entirely inadequate to produce intestinal movement, whereas the hypodermic injection of morphine is often speedily followed by purgation. This clinical fact is explained by the hypothesis that the lead has produced a condition of muscular spasm of the intestine which is increased when irritating cathartics are administered, whereas when the nervous and muscular irritation is relieved by morphine, spasm is relaxed and peristalsis takes place. It is claimed by some that obstinate constipation dependent upon renal or ovarian disease is often relieved by the administration of bromides, which, by decreasing reflex excitability, prevent irritability of the ovary or kidney from reflexly inhibiting intestinal movements. So far as we are aware the statement of Raviart that apomorphine when given hypodermically is a reliable purgative needs confirmation. While his remarks are not entirely original, a sufficient number of the profession have not yet employed this method to justify us in believing that it really is a remedy of great value for this purpose.

It has been held by some that in severe tympanites the administration of eserine in the dose of one-fiftieth of a grain by the stomach would exert its influence upon the intestinal coat and cause an expulsion or disappearance of the gas causing tympanites. We have employed eserine for this purpose in a number of cases, but we have never been able to satisfy ourselves that its action was very positive. It is an undoubted fact that eserine does influence unstriped muscular fiber, but how great its influence is in cases of disease is still uncertain.

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### *SOME FURTHER FACTS IN REGARD TO THE RELATIVE EFFECTS OF THE VARIOUS ANESTHETICS COMMONLY EMPLOYED.*

We have read with much interest the report of the Anesthetic Committee of the British Medical Association, which is published in an abbreviated form in *The Lancet* of January 26, 1901. Unfortunately, the statistics contained in this report are in one sense decidedly lacking in value, because chloroform is the anesthetic which has been employed in the vast majority of cases

which have been reported to the Commission. Thus out of 25,920 cases analyzed no less than 13,393 received chloroform; whereas 4595 received ether, 2911 nitrous oxide, 2071 ether, 678 the A. C. E. mixture, 597 nitrous oxide mixed with oxygen, 418 chloroform and ether in various proportions, 275 chloroform followed by the A. C. E. or by some similar mixture, and 155 A. C. E. followed by ether. It will be readily seen, therefore, that the vast majority of cases analyzed belong to the list which should be included under the heading of pure chloroform anesthesia, and a comparatively small number, about one-fifth, were cases in which ether was employed. Out of the 25,920 cases analyzed, very few produced untoward effects; or, in other words, 25,163 were reported as uncomplicated—that is to say, 97.169 per cent of the total cases of the record taken escaped any evil influence. Of the complicated cases, we find that a considerable number manifested symptoms which were only mildly dangerous, and that twenty-nine deaths are recorded in which the reporter stated that he believed the deaths to be purely due to the anesthetic.

It is interesting to note that a greater percentage of complications occurred when males were put under the influence of any one of these drugs than when females took them, being nearly six times greater in males than in females, although this ratio of danger symptoms varied with the anesthetic employed.

Thus *The Lancet* tells us that in males the percentage of danger cases under chloroform was nearly six times that of danger cases under ether, more than seven times that of danger cases under gas and ether, and nearly two and a half times that of danger cases under the A. C. E. mixture. In the female cases the percentage of danger cases was nearly twice that of danger cases under ether, more than twice that of danger cases under gas and ether, and nearly twice that of danger cases under the A. C. E. mixture. Minor complications too are notably more frequent in males than in females when ether is administered.

Another point of considerable interest is that the administration of chloroform by the towel method shows the highest percentage of complications and the highest danger rates, while the method of giving the drug on lint shows a striking diminution in both the complication and danger rate. These statistics also support previous statistics which have been published in showing that the death-rate from chloroform is far greater than the death-rate from other anesthetics. Of the twenty-nine deaths recorded, eighteen were from chloroform, and of these three are considered entirely due to the anesthetic; four to the anesthetic principally, and the patient's condition secondarily. Of the others there is either doubt as to the cause of the accident, or the death was distinctly due more to the condition of the patient than to the anesthetic. It is also of interest to note that of the deaths under ether, not one is held to be due entirely to the anesthetic, and the conclusion is reached that danger to life under the use of chloroform is greater than when other anesthetics are employed.

We publish in our Progress columns this month the conclusions that have been reached by the committee that we have named, as we believe that they are of very great importance. We hope that this committee, or a similar one, will continue the investigations, and that they will obtain a larger number of statistics dealing with the effect produced by ether as well as chloroform, because, as we have already pointed out, there is a relative lack, numerically, of cases of etherization as compared with those which took the more powerful and lethal drugs.

It is not to be forgotten that many physicians and surgeons are firmly convinced that while chloroform produces a greater number of accidents on the table than does ether, that ether, on the other hand, is very frequently responsible for secondary after-complications occurring when the patient has entirely recovered from the immediate effects of the anesthetic, and perhaps as long as forty-eight or seventy-two hours after the operation. These symptoms are usually supposed to be associated with the lungs or the kidneys. Personally we believe that in many instances when congestion of the lungs, or urinary suppression, occurs, the difficulty is due to cold and exposure during the operation, combined with the shock, and that the anesthetic is not largely responsible for it. But as we have said, many believe that ether is responsible for these complications in some instances.

In the report which we have named, Professor Ramsey, who is the professor of chemistry in University College, London, publishes a report upon the samples of the anesthetics employed in cases displaying dangerous symptoms; and Lawrie, of Hyderabad, sends a report of 1521 cases of chloroformization in India. As Colonel Lawrie has

now reported more than 30,000 administrations of chloroform, any statistics compiled by him must possess extraordinary importance and interest.

There is one more point in connection with these statistics which we think is worthy of emphasis. To quote *The Lancet* again, the frequency with which cases of danger occurred in persons in good condition was as follows: With chloroform, one in every 133 administrations; with ether, one in every 654 administrations; and with gas and ether, one in every 834 administrations—once more emphasizing very strongly the fact that chloroform is the more dangerous drug of the two.

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### *PNEUMONIA FOLLOWING SURGICAL DISEASES.*

Though it is possible that the prostration following a serious surgical operation may predispose the individual to an attack of ordinary epidemic or endemic pneumonia, this fact will not account for the comparative frequency with which inflammation of the lungs complicates the convalescence of operative cases, particularly such as have been subjected to intraperitoneal manipulations.

Kelling, quoted in *Schmidt's Jahrbücher*, 1901, Heft 1, notes that this postoperative pneumonia is most likely to follow operations on the stomach. The first symptoms develop in from nineteen to twenty-four hours after operation. He believes the cause can be traced to infection occurring during the course of the operation. This infection comes probably from the air which is often sucked in and blown out of the belly cavity with each respiratory movement, necessarily carrying with it directly into the peritoneum an enormous number of germs. Also, as an etiological factor, the cooling effect of this air upon the diaphragm must be considered.

Having explained the development of pneumonia after stomach operations on this basis, Kelling takes every precaution against moving currents of air during an operation. He keeps the operating-room hot, the floor is made moist, and by means of gauze he prevents aspiration of air into the subdiaphragmatic space. He has thus greatly diminished the number of postoperative pneumonias in his service.

Though it is true that pneumonias following operations are due to infection, and that this complication is particularly likely to occur following operations on the stomach, the commonly accepted explanation is dependent on the fact that through limitations of the breathing motions incident to local peritoneal congestion and pain, the ventilation of the lungs is incomplete; hence the circulation is retarded and congestions and exudations encouraged. Moreover, Souques reports cases which seem to show that after severe contusion of the lungs, pneumonia may occur in parts of these organs not directly affected by such contusion. This can be attributed to reflex from the pneumogastric nerve causing paralytic dilatation of the pulmonary vascular system.

Pneumonia following extraperitoneal surgical operations is nearly always embolic. When it is distinctly septic the prognosis is extremely grave.

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### *THE TREATMENT OF SYPHILIS.*

There are certain teachings in the treatment of syphilis which are universally accepted. Among these may be mentioned the use of mercury in the secondary period, mercury and potassium iodide in the tertiary period, and the need of a treatment continued for from two to four years. It is generally believed, perhaps mainly because of Fournier's writings upon this subject, that late recurrences of syphilis are due to inadequate treatment in the secondary and early tertiary stages of the disease. It is a very common practice to gauge the dose of mercury appropriate to each individual by the quantity of the drug which is found by one trial to produce slight signs of ptyalism; one-half of this quantity is given daily, with a number of periods of rest, for two years. As to the period at which the mercury treatment should begin there is much difference of opinion. Perhaps the majority of men most experienced favor waiting until the diagnosis is absolutely confirmed by the appearance of the secondary symptoms. Among these is Blaschko, who holds that mercury acts as an antitoxin, paralyzing and neutralizing the poisonous products of the syphilitic virus. This action is especially well shown in those cases of syphilitic intoxication characterized by heaviness, pain in the limbs, night sweats, sleeplessness, headache, and general prostration. Even after a single injection of one or two inunctions these symptoms will disappear as by magic. It is obvious that the virus is not directly acted upon by the mercury. The drug when used in the treatment of syphilis

does not prove effective because of its bactericidal powers; nor do medicaments introduced into the system become equally distributed throughout all its parts. Drugs exhibit an elective affinity for certain parts of the organism, and it seems clear that mercury exhibits such an affinity for the proliferations caused by syphilis.

Blaschko, in considering the effect of treatment upon the developments of late tertiaries, calls attention to Groen's statistics, which seem to prove that in Norway, where cases of syphilis are not treated by mercury, the percentage of tertiary cases is not greater than that in other European countries. Moreover, it seems fairly well demonstrated that tabes and progressive paralysis are most common in the very class which is most carefully and conscientiously treated during the secondary and early tertiary periods of syphilis.

In Dalmatia and Bosnia, where syphilis is extremely common, and where the treatment is greatly neglected, tabes and progressive paralysis are unknown.

These and other similar facts seem to show that the development of late degenerations of the nervous system are dependent rather upon heredity, temperament, and mode of life, than upon the neglect of treatment during the secondary stage of syphilis.

Against this belief there is ranged not only the experience of Fournier, but that of most of the syphilographers of the world, although the influence of heredity in the development of nervous affections cannot be denied.

The importance of a prolonged mercurial treatment in the prevention of spinal and cerebral degenerations is well established.

Blaschko states that mercury is not so well borne by patients who have had no manifestations of the syphilis as it is by those who exhibit symptoms of the disease. This is in a measure true. When the hemoglobin is lowered and the general health impaired by the syphilitic virus, mercury administered in proper doses produces an immediate improvement in the health. It is, however, by no means proved that a person with syphilis will exhibit more tolerance toward mercury than a person who has not the disease.

It is also true that if mercury be continued in full doses after all symptoms have disappeared, the blood has returned to normal, and the general health of the patient has been restored, ultimately there will be impairment in health and loss of weight, together with a diminution of the hemoglobin. It is evident then that mercury can be given in too large doses and can be continued too long.

The points most difficult for the physician to decide in treatment of syphilis are the proper choice of the mercuric preparation, the dose suitable to the individual, and the appropriate interval of rest.

The two best indices as to the quantity of mercury which should be given in an individual case are afforded by an examination of the blood and by taking the body weight. Syphilis produces a diminution of the hemoglobin, often very marked, but sometimes inappreciable. Mercury in proper doses will bring the blood to its normal; in injudicious quantities it will always reduce the body weight. The patient who, under a mercuric course, has exhibited no manifestations of the disease but has steadily lost weight and condition, is probably suffering because he has received an overdose of the drug.

The need of intervals of rest in the treatment of syphilis is now well recognized, and syphilographers have devised a set formula. Thus, the patient will be directed to take the mercury for three out of every four weeks in the month, and to continue this treatment for one year. During the next year the intervals of rest will be somewhat increased. Such a formulation can never be of practical use.

The dose of mercury for each individual is that which will cause the entire disappearance of all syphilitic symptoms and which will keep him in good general health.

Even more important than the proper dosage of mercury is the attention to be paid to nutrition and to the general health. The belief that syphilis is a curable disease, and that it is surely and permanently curable in a large percentage of cases, is justified by experience. Experience also teaches that a wisely directed and long-continued treatment affords the best assurance against late recurrences. It also shows, however, that such a cure cannot counteract the effects of alcoholism or sexual excess, and that patients with such addictions are likely to develop spinal degenerations even when the treatment is most faithfully adhered to and is long continued.

Of the various methods of administering mercury, inunction is the safest and most effective. The method by hypodermic injection has never become widely popular in either England or America. Mouth administration remains the most popular method

because it is the easiest. Of the drugs employed in this latter method, mercurous iodide, yellow, mercury with chalk, and corrosive sublimate are the popular preparations.

The objection to the mouth administration of mercury is based on the circumstances that the quantity taken into the stomach by no means represents the quantity circulating in the system, and that a gastroenteritis excited by these drugs not only weakens the patient and lessens his resistance, but materially interferes with the proper absorption of the mercurial preparation.

## Reports on Therapeutic Progress

### *THE TREATMENT OF TUBERCULOSIS BY SODIUM CINNAMATE.*

The *Philadelphia Medical Journal* of December 1, 1900, contains an article on this subject by Dr. MANN. The treatment Dr. Mann has used in these cases, and is still using, consists of intravenous injection of solutions of sodium cinnamate, or hetol, as it is called, and he has followed very closely in all details the directions given by Professor Landerer.

Beginning with $\frac{1}{100}$ to $\frac{1}{80}$ of a grain, the dose is gradually increased to $\frac{1}{4}$ or $\frac{1}{3}$ of a grain, which should rarely be exceeded. The injections are repeated every other day. It is very important to use only perfectly pure preparations, such as are made synthetically by certain German chemical houses.

The technique of the injections is very simple, the main point being to secure perfect asepsis. The hands of the operator, the skin about the point of injection, and the instruments, should all be carefully sterilized. Usually the median basilic or cephalic vein, one or the other arm, is selected for the operation. By encircling the arm some distance above the elbow by an elastic bandage, the vein is rendered prominent and its walls become tense. The needle is then plunged slantingly through the skin and wall of the vein at once. If immediately after the injection and before withdrawing the needle the bandage is loosened, and the arm raised up, there is not a drop of blood, as a rule, when the needle is drawn out. The skin about the point of injection is rubbed with ether, then with alcohol. The needle, the point of which should be fine and kept well polished, and which ought to be used for no other purpose, is placed in strong alcohol for twenty minutes, before and after using, and the same liquid should be forced through it. Boiling can then be dispensed with, which is an advantage, as it corrodes the point and causes it to pass through the tissues with difficulty. Dr. Mann has made use of this technique in over 800 injections, and has never had the slightest local infection. Indeed, in one of his cases over 100 injections were made in a single spot less than half an inch square, without a trace of visible effect remaining. An aseptic dressing should be kept over the site of the puncture for a few hours.

The duration of treatment naturally varies considerably. Light cases and those with a purely tubercular infection require a very much shorter period of treatment and furnish a much larger proportion of favorable results than patients with wide-spread disease, fever, cavities, and multiple infections.

There are several side effects of the sodium-cinnamate treatment that are worthy of mention, partly because of the extremely interesting bearing on the question of the origin of uric acid in the blood.

In a recent address by Professor Ewald before the Medical Society of Berlin, in which he presented at length a report of his use of sodium cinnamate, he called attention to a marked drowsiness that he observed in many of the patients undergoing this treatment. Landerer stated that he had not observed this symptom, and thought that perhaps Ewald's doses had been too large. Dr. Mann has noticed this symptom in quite a number of his patients, and can produce it at will by increasing the size of the dose. It does not appear until ten or twelve hours after the injection, and usually with moderate dosage disappears in twenty-four to thirty hours. He thinks it indicates a dose that is rather too large, and it corresponds in the time of its occurrence with the period of diminution in the number of leucocytes in the blood and the probable destruction of many of them. The sensation is exactly the same as the so-called uric-acid fatigue, and according to Horbaczewski's theory of the formation of uric acid from the nucleins of broken-down leucocytes, its pathogenesis would be comprehensible. A number of patients noticed and reported to him that they slept very soundly and long while they were taking the injections, more so than usual, and one found it harder to sleep each time the injections were stopped for a period.

In several patients there occurred repeated

attacks of acute muscular rheumatism, which were absent during the long intervals of treatment, and seemed to have a relation with the injections, due perhaps to the same chain of causes as the drowsiness. In one patient with chronic gout the affected joints became painful two or three weeks after the treatment was begun on more than one occasion.

Generous doses, especially in severe and febrile cases, are apt to be followed within twenty-four hours by a slight rise in temperature. In Dr. Mann's experience it has usually not exceeded a degree or a degree and a half; but by keeping accurate records of the daily temperature curve it could be very plainly made out in several cases.

In his cases he has not noticed any decided tendency in the drug to cause hemorrhages. The moderate inflammatory hyperemia observed in Landerer's experiments leads one to expect small leakages of blood, but he has not observed these or larger bleedings, except in cases that had been having them before the treatment was begun.

While Dr. Mann is a firm believer in the great value of an out-of-door life, in rest, and in the advantages, undoubtedly very considerable, of certain climates, especially the high and dry ones, in the treatment of patients with tuberculosis, still he recognizes the fact that in many cases all these means are not enough, and we want every possible help we can get in addition.

Dr. Mann's experience with sodium cinnamate in the treatment of consumption has given him favorable impressions of its effects. He thinks he has had good evidence that it will quicken to a marked extent the healing processes, when they are sluggish or altogether inactive, in some, though not in all, of the cases. Most of his experience in its use has been with rather severe cases, and the art of prognosis is here proverbially difficult, yet it seems to him that the results have been very encouraging—that is, better than they would have been without it—and he will continue to use it in addition to the other good methods that are available and that ought not to be neglected in any case.

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### *THE DISEASES OF THE BRONCHIAL GLANDS.*

In the *Philadelphia Medical Journal* of December 1, 1900, HALL in an exhaustive paper on this theme expresses the belief that the diagnosis of this disease, though often obscure, is sufficiently clear, by inference at least, to direct us as to the treatment. In tuberculous and bronchopneumonic enlargements, and those following measles and whooping cough, cod-liver oil is the remedy above all to which we must turn, with the hope of influencing these glands as we do those of the neck in scrofulous enlargements. The syrup of iodide of iron should be given if anemia exists. The general tonic and roborant measures indicated in early tuberculosis are of the utmost value here. Such treatment should be long continued, for the danger of development of tuberculous meningitis has been shown to be a grave one. Until the child has fully regained his health and the weight normal for his age, he should be carefully watched, that nothing avoidable may be allowed to interfere with his general health.

Simon and many English physicians insist that counter-irritation with iodine is of great value, while arsenic is given internally for its resolvent effect. Creosote is stated by Voelcker to be of great value. Spengler believes in the use of tuberculin in cases of tuberculosis of the glands if there be no mixed infection. This has not yet met with general approval. For the syphilitic cases the usual iodide treatment should be vigorously pushed.

For the enlargements secondary to malignant growths we can do nothing, and adenitis found as a part of the various blood diseases calls for no measures beyond those otherwise indicated.

In case suppuration takes place, the pus lies near the surface of the chest; it may be possible to evacuate it by aspiration or incision, although cases are very few in which such a line has been followed. Dr. Hall saw Whitney aspirate in his case unsuccessfully, the glands probably being still too firm to yield fluid, although subsequently the pus was evacuated freely through rupture into the esophagus—a brilliant diagnosis and a happy result. In a case of his own, seen also by Drs. Elsner, Parkhill, and Bagot, in which the diagnosis yet lies between sarcoma and tuberculosis, probably originating in the mediastinal glands, four exploratory punctures yielded nothing. Some three months subsequently, after the case had passed from his observation, the swelling at the second left interspace ruptured and discharged pus, so that he now inclines to the diagnosis of tuberculous glands. In this case numbness extended down the left arm, suggesting pres-

sure upon the brachial plexus by communicating glands, as in Eskridge's cases. Edema of the feet, not accounted for either by cardiac, renal, or hepatic trouble, nor by anemia, suggested a possible pressure of enlarged glands upon the inferior vena cava, which lessened somewhat under a tonic treatment directed to the possibility of tuberculosis. This case is rich in suggestions rather than in positive results.

Voelcker recommends free exploration by resection of ribs and the use of the needle, although the results of this treatment have not been at all brilliant, all dying shortly after its adoption. Since, however, these measures have been used where extensive cavity formation and even gangrene of lungs have been diagnosed, we should not be discouraged. His suggestion that gangrene in these cases tends to extend downward, so that the operation should be a low one in case of doubt, seems to be sound.

Sudden dyspnea, not otherwise accounted for, especially in a child who, from previous disease involving the respiratory tract, may be suspected of having breaking-down bronchial glands, would call for the same vigorous measures as if a foreign body had been inhaled. Petersen's case, already quoted, is the only one within Hall's knowledge, but in spite of the often rapidly fatal result of the sloughing of a gland into the air-passages, successful removal may follow correct diagnosis in case the patient lives long enough for the attempt.

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### *THE SYMPTOMS AND TREATMENT OF HYPERACIDITY OF THE STOMACH.*

In the *Boston Medical and Surgical Journal* of November 29, 1900, HEWES tells us that the treatment of this clinical condition of hyperacidity of the stomach is based upon a knowledge of the cause and its effects which we gain by an experimental study of the condition. In these cases the exciting cause, the excess of acid, acts to produce disturbance and symptoms in several ways. In the first place it may irritate the membrane of the organ, causing pain or distress, peristaltic unrest, regurgitation, heartburn, pyrosis. It inhibits the digestion of starches by the ptyalin of saliva, and may then tend to the accumulation of starch in the stomach. It acts upon the motor processes of the stomach, often diminishing the activity, even causing spasmodic contraction of the pylorus, so that retarded emptying or stasis of the contents may result. All these effects, the irritation of the acid, the affection of the motility, the retardation of starch digestion, may have results in causing symptoms, the distress, eructations, heartburn, vomiting. The affection of motility may cause stasis of contents, when dilatation or fermentation by yeast or sarcinæ may occur.

In addition to and through those specific disturbances of function, the disorder has detrimental results to the body generally. As a result of the distress accompanying the act of digestion the patient eats less food than necessary. This, with the nervous influence resulting from the irritation and disturbance, affects the nutrition of the body. As a result the health is impaired, the nerve tone affected, and the stomach made even less able to gain upon its disease. The irritation of the acidity also has disturbing effects upon the nervous system which doubtless tend to perpetuate the increased secretion of the stomach and the intolerance of food.

In addition to the above specific source or sources of disturbance or symptoms in these cases, we have to consider still another element which may be present as a pathological condition influencing the disorder, namely, the relative hyperesthesia of the patient. A close study of our case reveals the fact that the severity of disturbance of function or symptoms is not proportional to the quantity of acid present. Cases with great excess may have symptoms milder than those with very slight excess. We not uncommonly see cases of clinical hyperacidity yielding to treatment of this affection in which the quantity of acid is normal for the average individual. Furthermore, in treating certain cases of hyperacidity we find that after cure of all disorders the quantity of acid remains the same or above the normal limits.

These facts suggest that in certain cases increased or abnormal susceptibility of the patient to the secreted acid is a causative element in the case. This is, perhaps, the case with those individuals who suffer with normal amounts of acid, and probably with those who, when cured, still retain the excess of acid. These cases might better be termed gastric hyperesthesia. In treating them, by building them up, or by neutralizing the acid which tends to maintain the sensitiveness, we relieve the hyperesthesia and stop the symptoms. It is probable that this element of hyperesthesia enters to some extent together with the acid excess as a factor in the dis-

turbance of many of the cases. And thus in developing our method of treatment we must bear in mind these two causal conditions—the excess of acid with its irritation and its influence upon the motor and digestive functions of the stomach, and the possible hyperesthesia of the patient having its origin in his nutritional or nervous condition. In this treatment we attack our case along both lines. We aim (1) to reduce the acidity of the contents, and (2) to increase the resistance of the patient to the acid—that is, to improve the nutrition and nerve tone. Practically we find that an attack along either line is beneficial for both purposes.

To reduce the acidity of the contents, our first aim in the treatment, we may, as a first resort, administer substances which combine with or neutralize the acid. Such substances are, first, proteid food substances, which combine with large quantities of acid, and secondly, alkalies, which neutralize the acid present. This is a simple method and works in a large majority of cases very satisfactorily. The excess of acid can be perfectly controlled by the food with small quantities of alkalies, provided these substances are administered in the proper manner and at the proper time. In some cases this regular control of the acidity leads finally to a lessened secretion. In almost all cases it does away with irritation and disposes of the disturbance due to the acid excess and the symptoms of these. With the improved function which follows this treatment, and the full diet which is part of it, the system tends to regain its normal tone and the hyperesthesia of poor condition is controlled.

The system of treatment which Dr. Hewes has used in most cases is built up upon these lines: The patient is given a diet of a calorie worth sufficient for the weight and conditions containing as high proportion of proteid foods as comfortable for the patient. (In his experience, the average patient with stomach trouble is eating less than half of a sufficient diet.) This diet is separated into six daily meals, the constituents of each meal, with some alternative choice, being prescribed. The treatment tends to use up the acid secreted and facilitates the motor function. Starches should be limited, and of carbohydrate foods, sugars or predigested starches, dextrinized flours, as Avencia flour or Horlick's food, used as much as possible, since starch digestion in the stomach is impeded in these cases. For all symptoms of disorder, as distress or eructations, some proteid, as a raw egg, is to be taken. An alkali, bicarbonate of soda in half-teaspoonful doses, or fifteen grains of magnesia hydrate, may be taken in addition to food, or in place of it, for the relief of symptoms. In some cases large amounts of alkali, three drachms bicarbonate of soda, must be used in the twenty-four hours. Three pints of water is prescribed to be taken in small amounts at a time throughout the day. In addition, general rules in regard to baths, exercise, the bowels, the work, and general manner of living are laid down in writing. Debility must be treated by tonics. Nux vomica is a most useful agent here to improve the tone of the system, and thus also perhaps the motor capacity of the stomach. Where anemia is present by blood tests iron should be given. Chlorosis is not infrequently associated with hyperacidity. After an administration of iron with the regular régime for a few weeks these cases as a rule lose all symptoms of hyperacidity, even with cessation of treatment. There is little doubt that it is a similar improvement in nutrition which accompanies the increased diet, and good régime and freedom from nerve disturbance, which insure the cure in a majority of all the cases.

The exact details of treatment of course vary with the cases. Many cases of hyperacidity are intermittent or paroxysmal. These cases it is necessary to treat locally only during the period of attack, while a general method of régime should be employed constantly to prevent recurrence. In some cases the acidity is only after one meal, as, for example, dinner. This must be borne in mind in the determining of the diagnosis as well as in the treatment. We must get the contents at the period of symptoms.

This treatment gives excellent results in the great majority of cases. In some relief is immediate, and with the return of normal tone it is possible after a month or two to drop special treatment. In a majority of these cases the acidity is found in time to be normal; in others the acidity remains as at first, though the symptoms disappear. In a certain proportion of cases the treatment must be followed in a general way permanently. It is impossible to collect accurate statistics of cure from an out-patient clinic; but it is certainly a rare exception to see a case of hyperacidity which does not yield to this treatment when properly applied. In Dr. Hewes's records he finds less than ten per cent of cases returned as not relieved

after trial of this simple treatment of régime, diet, and alkalies. In these obstinate cases lavage is often a useful adjunct to treatment. After a few weeks of lavage combined with a very special diet worked out by experience with the case, the patient is raised to the regular régime. In these cases it is often necessary to feed small amounts frequently and to use concentrated food substances, as the Leuke-Rosenthal meat solution, Mosquera beef meal, somatose, which have a high capacity for combination with hydrochloric acid. Such cases are, however, exceptional. As a rule the diet of easily digested or liquid foods is the least useful one that can be chosen. In some obstinate cases Dr. Hewes has used nitrate of silver for internal treatment and for lavage with success.

It is well known that our cases of hyperacidity are of two types: one in which a neurosis or functional hyperactivity appears to be the fundamental element in the case, and one in which a marked increase in the gland tubules and oxyntic cells of the gastric membrane is present as an underlying pathological condition. This latter condition, a form of chronic gastritis, the gastritis acida of Cohnheim, is diagnosed by the presence of fragments of the pathological membrane in the stomach washings. It is said by some observers (Hemmeter) that fifty per cent of the cases of hyperchlorhydria have some such hyperplasia of the tubular structures. Typical cases of this condition are, however, much less common, and such fragments are, in Dr. Hewes's experience, found in a much less percentage of cases by ordinary methods of examination. When the condition is obstinate, and does not tolerate the regular treatment, it is well to investigate specially as to whether the case is one of this gastritis acida. For such cases, and indeed for all cases proving obstinate to the proteid treatment, the method of continuous treatment upon low proteid diet should be tried.

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### *REPORT OF THE ANESTHETICS COMMITTEE OF THE BRITISH MEDICAL ASSOCIATION.*

This valuable report is referred to in our editorial columns, and is taken from the London *Lancet* of January 26, 1901. The conclusions reached are as follows:

*Relative Safety of the Various Anesthetics.*—(1) The relative safety of the various anesthetics may be gathered from the statistical tables in the report. When only those cases of danger which were held to be due entirely to the anesthetic are considered, the following instructive figures are obtained, further emphasizing the danger of chloroform as contrasted with ether. Cases of danger (including deaths) considered to be entirely due to the anesthetic: under chloroform, 78, giving a danger rate of 0.582 per cent; under the A. C. E. mixture, 1, giving a danger rate of 0.147 per cent; under mixtures of chloroform and ether, 2, giving a danger rate of 0.478 per cent; under the A. C. E. mixture followed by chloroform, 1, giving a danger rate of 2.2 per cent; under chloroform followed by mixtures of alcohol, chloroform, and ether, 1, giving a danger rate of 0.36 per cent; under ether, 2, giving a danger rate of 0.065 per cent; under "gas and ether," 3, giving a danger rate of 0.096 per cent; under ether preceded by chlorofom, 1, giving a danger rate of 0.480 per cent; under ether preceded by the A. C. E. mixture, 0; under the chloroform group of anesthetics (addition of the first six headings above), 88, giving a danger rate of 0.584 per cent; and under the ether group of anesthetics (addition of the last four headings above), 6, giving a danger rate of 0.085 per cent. (2) Although (excluding nitrous oxide) ether may be accepted as the safest routine agent, certain circumstances determined by the state of the patient, the nature of the operation, etc., may render the use of some other anesthetic or combination of anesthetics both safer and easier.

*The Best Methods of Administration.*—(3) No method of administration of chloroform is free from danger, but an examination of the complicated cases appears to show that the occurrence of danger depends largely upon the administrator who employs any particular method. (4) No conclusion from the evidence before the committee as to the best method of administration of ether and "gas and ether" is possible. (5) The data warrant the conclusion that the A. C. E. mixture should not be given from a closed inhaler—*e.g.*, Clover's. (6) This conclusion applies to all mixtures containing chloroform.

*Best Methods of Restoration.*—(7) The subcommittee are unable from the material at their disposal to draw any conclusion upon this point.

*Clinical Evidence Regarding Anesthetics Generally.*—(8) Anesthetics are more commonly associated with complications and dangers in males than in females. (9) Excluding in-

fancy, and taking anesthetics collectively, the complications and dangers of anesthesia increase *pari passu* with advancing age. (10) Anesthetics are notably more dangerous in proportion as the gravity of the patient's state increases. (11) Danger to life is especially likely to be incurred at early periods of the administration of anesthetics, while the tendency to less grave complications increases directly with the duration of the anesthesia. (12) The tendency for complications, dangerous and otherwise, to occur increases *pari passu* with the gravity of the operation.

*Clinical Evidence Regarding Chloroform.*—(13) Chloroform is about twice as dangerous in males as in females. (14) Chloroform is most dangerous during early infancy and after thirty years of age; least so from ten to thirty years of age. (15) In conditions of good health chloroform is very much more dangerous than other anesthetics. In grave conditions chloroform still remains the least safe anesthetic, but the disparity between it and other anesthetics is far less marked than in health. (16) When danger occurs under chloroform, whatever its exact nature may be, there is abundant evidence that in a large proportion of cases the symptoms that are observed are those of primary circulatory failure. (17) Imperfect anesthesia is the cause of a large number of cases of danger under chloroform. (18) Vomiting during anesthesia, which may lead to danger, seems to be more frequent under chloroform than under other anesthetics. (19) Struggling is very much more frequent in the complicated cases under chloroform than in the uncomplicated, and this phenomenon must therefore be regarded as a source of grave danger under chloroform. (20) The tendency for circulatory complications to appear increases with the relative amount of chloroform in the anesthetic employed. (21) While vomiting is more common after administrations of ether, severe and prolonged vomiting is more common when chloroform has been used. (22) Circulatory depression following anesthetics is more common after chloroform than after ether. (23) While the respiratory complications of anesthesia as a whole are of equal frequency under the ether and chloroform groups respectively, yet those that occur under ether are mostly of a trifling and transitory nature, while those that occur under chloroform are more grave and persistent.

*Clinical Evidence Regarding Ether.*—(24) Under ether the complications of anesthesia are more frequent with males than with females, but with the former they are generally slight, ether being rather more dangerous with females than with males. (25) Ether, where employed throughout or preceded by nitrous oxide gas or by the A. C. E. mixture, is singularly free from danger in healthy patients. (26) Minor troubles in administration due to laryngeal irritation and increased secretion are more common under ether and "gas and ether" than under chloroform and its mixtures. (27) Struggling occurs more frequently with ether when given alone than with other anesthetics, but it rarely leads to danger. (28) After-vomiting is more common with ether than with other anesthetics, but it is usually transient. (29) Bronchitis is much more common as an after-effect of ether than of chloroform. (30) With "gas and ether," as with ether, dangers are more common in females, although complications are more frequent in males.

*Clinical Evidence Regarding Mixtures and Successions of Anesthetics.*—(31) The A. C. E. mixture in most of the statistical tables holds an intermediate position between chloroform and ether. (32) The A. C. E. mixture is more dangerous in males than in females, but not to such a marked degree as is chloroform. (33) The administration of ether antecedent to chloroform does not abolish the possibility of chloroform dangers. (34) The various mixtures and successions of anesthetics were recorded too frequently to justify definite conclusions.

*General Conclusion.*—(35) From the evidence before the subcommittee, they are convinced that by far the most important factor in the safe administration of anesthetics is the experience which has been acquired by the administrator. In many cases the anesthetization completely transcends the operation in gravity and importance, and to insure success, particularly in these cases, it is absolutely essential that an anesthetist of large experience should conduct the administration.

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### *TREATMENT OF ACUTE DYSENTERY, WITH SPECIAL REFERENCE TO USE OF MAGNESIUM SULPHATE.*

Dr. W. J. CRUIKSHANK said before the Kings County Medical Association, so we are told in the *Journal of the American Med-*

*ical Association* of January 5, 1901, that from January till December, 1897, 97,000 persons had been stricken with dysentery in Japan, and 70,000 had died. In one province there had occurred, in 1890, 801 cases with 225 deaths, and in 1891, 8390 cases with 2163 deaths, or a mortality of a little over twenty-six per cent. Every country in Europe has paid a heavy tribute to dysentery. In the tropics this disease destroys more lives than cholera, and has been more fatal to armies than powder and shot. In France dysentery is accountable for one-twentieth of the total mortality in the army, and in Algeria it represents one-fifth of the total mortality. In epidemics occurring in temperate climates the mortality varies from seven to fifteen per cent. In tropical epidemic dysentery, the mortality is between twenty and thirty per cent, although even so high a mortality as sixty or seventy per cent has been noted in certain epidemics. Military experience in the tropics shows that acclimatization has no effect on dysentery. According to Pepper, this disease was responsible for the death of 300,000 of the soldiers during our civil war. The recent official reports from the United States army and navy do not give detailed information regarding dysentery during the late war with Spain. In the year 1898 there had been 368 deaths from dysentery in Greater New York, and in 1899, 267 deaths. The preponderance of evidence seems to be in favor of the amebic theory as to the etiology of this disease. Bacteriologists are agreed that dysentery is the result of microbic infection, but opinion is divided as to whether it is the result of a specific microorganism or of several bacteria.

The speaker expressed the opinion that the so-called varieties of dysentery are chiefly founded on mistaken ideas regarding the etiology and pathology of the disease. Dysentery has been frequently confounded with simple diarrhea and enteritis. One of the most misleading of these so-called varieties is that designated as malarial dysentery. Dysentery is one disease, and one only, whether observed in the tropics as endemic or in the temperate regions as sporadic. Even so careful and conservative a writer as Flexner has expressed the opinion that the conclusions of bacteriologists which led to the establishment of various types of the disease might not be strictly in accordance with fact. He is of the opinion that the causative agent of dysentery might not vary in these different types.

The reader of the paper expressed the belief that the underlying principle of treatment is purgation, in spite of the many statements of medical authorities to the contrary. The remedy he recommends is magnesium sulphate used in such a way as to secure depletion of the vessels, rather than purgation. He believes that this remedy is as nearly a specific for dysentery as quinine is in malaria, or mercury and potassium iodide are in syphilis. In all cases of acute dysentery, from the beginning of the attack until there is a subsidence of the symptoms, it should be administered in drachm doses every two hours, dissolved in a very little water and mixed with a little aromatic sulphuric acid. If tympanites is present, it will rapidly subside under this treatment. At the end of forty-eight hours the stools will become biliary and feculent in the vast majority of cases. When the stools have become nearly normal the medicine should be gradually withdrawn. The average duration of the disease under such treatment is from three to seven days. The practitioner is often tempted in these cases to give a hypodermic injection of morphine to relieve the pain, but Cruikshank's experience has taught him that almost as great relief follows the use of the magnesium sulphate. By stimulating the naturally sluggish liver to greater activity the sulphate increases the biliary secretion, and in this way acts somewhat antiseptically, he believes, though he well knows that this is a mooted question in physiology. This remedy, by abstracting water from the tissues and pouring it into the intestine, depletes the mucous membrane, diminishes the inflammatory process, and rids the intestinal canal of the infectious material. The physiological action of this medicine has been known and appreciated for years by gynecologists and surgeons. Dr. Cruikshank said that his attention has been directed to this method of treatment by a case which he treated some years ago, according to the plan then in vogue—that is, the alternate administration of sulphate of magnesium and opium. He had noted the great improvement in all the symptoms following the use of the sulphate, and the return of the dysenteric symptoms when opium and bismuth had been given, but he did not have the courage to depart from this approved plan of treatment, and on calling in eminent counsel it had been indorsed as the proper one. The patient died after ten days.

The author gave copious citations from a

number of medical authors who had found magnesium sulphate exceedingly useful, and vastly superior to the other remedies commonly employed. His conclusions are: (1) Dysentery is a disease of great gravity; (2) it is both contagious and infectious; (3) it is caused by the introduction into the system through food and drink, and also through the air, of a specific microorganism the identity of which seems still in doubt; (4) dysentery is one disease in whatever latitude it is found, and the only varieties are those based on the intensity of the morbid process; (5) the therapeutic agents suggested for the treatment of acute dysentery are useless and often harmful, and magnesium sulphate acts as a specific.

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*THERAPEUTIC NIHILISM.*

The *Journal of the American Medical Association* of January 5, 1901, points out editorially that optimism, not pessimism, is needed in medicine; not, however, the optimism that takes up each new fad to the exclusion of old and tried measures, but the kind that begets hopefulness and confidence. There is a tendency, among a few, to therapeutic nihilism that is to be regretted. He who has watched a huge cardiac edema subside under the intelligent administration of digitalis, or who has seen an angry tertiary syphilide fade away under full doses of potassium iodide, or, above all, who has seen the threatening false membrane of diphtheria shrivel and fall after the use of antitoxin, can never honestly express a disbelief in the benefits of modern therapeutics. Those who are yet opposing the use of antitoxin argue chiefly from *a priori* reasoning. The men who are treating diphtheria with antitoxin, and who are old enough to compare their own results under the old means with those since they began to employ the new, have another tale to tell. The therapeutic nihilist has no place in modern medicine, now the science of therapeutics is becoming thoroughly rational. Profession of disbelief in measures for aiding in healing of disease is a confession of personal failure in practice. The fault is in the man, and not in the method. Many diseases yet baffle us, and many of our agents are not yet perfect, but the spirit that will lead to a better state of affairs is only that of hopefulness and of belief in the capacity of medical science to grow until more and more diseases are conquered.

*HOME BATHING IN TYPHOID FEVER.*

In the *Medical News* of January 5, 1901, Dr. SIMON BARUCH describes certain hydropathic methods by means of which patients suffering from typhoid can be treated for pyrexia without the necessity of a bath tub. He insists that cold water, besides mechanically reducing the temperature by actual abstraction of heat, stimulates the circulation. This second purpose, however, of cold applications is only accomplished if friction accompanies the use of cold. The presence of the toxins of typhoid fever in the circulation relaxes the arterioles all over the circulation and so makes harder work for the heart. The application of cold then helps the circulation by toning the arterioles, thus making the blood paths narrower and the heart's pumping easier. Clinically this result cannot be observed by the disappearance of cyanotic conditions after the bath. Typhoid patients always look better after the bath; when they do not it is because some element in the technique has been neglected. The effect of the bath on the kidneys is like a summer shower on the parched plants at the end of a heated spell. Toxic materials have gathered as sources of irritation, just as dust gathers on the leaves of the plants, and when the circulation is toned up the narrowing of the lumen of the capillaries in the kidney sends the blood more rapidly through them, flushing them out and making diuresis more complete and efficient.

Reaction must follow cold bathing always, or the purpose of the bath is rendered abortive. We might think that emphasis need not be placed on this point in our day. Consultation of some of the text-books, however, shows what mistaken notions may be conveyed by ill-given directions. Lauder Brunton, the distinguished English therapeutist, in his text-book of therapeutics, edition of 1898, says that when the patient's temperature reaches a certain point he should be placed in the bath and left there until his temperature comes down. When he is first put in, the temperature of the water should be about 65° F., and this may be reduced by additions of colder water or ice to 40° F. It is no wonder that he concludes his directions with the advice to remove the patient from the bath before his temperature becomes quite normal, because it may sink still lower after the patient is put to bed and symptoms of collapse may ensue. The main purpose of the bathing is neglected if these directions are followed and no fric-

tion is employed during the bath. No wonder under such circumstances that the bath should prove an unpopular remedy.

The use of rubber tubing through which cold water is allowed to flow is usually a mistake. It does produce local lowering of the temperature, but absolutely without any compensatory stimulation. After its application the skin will be found blue and pallid. For nearly the same reason sponge-baths, as they are usually given, are objectionable. The application of cold water in this way does lower the temperature, but it fails to produce any other good effect. Remedies for fever, it should be borne in mind, must be antifebrile as well as antipyretic. Antifebrile therapeusis modifies all the symptoms produced by the fever, especially the relaxation and tendency to exhaustion. Antipyretics only reduce the temperature, without affecting other symptoms of the fever. Above all, remedies must encourage the elimination of toxins from the circulation. This is best accomplished by general stimulation that makes every organ do its work and so arouses the reactive vitality.

Patients whose temperatures are above 102.5° F. should be rubbed with a wash cloth wrung out in cold water. As soon as the patient shows any signs of chilliness that are not relieved by the friction, the rubbing should cease. When his temperature reaches the same point as before, water five degrees colder in temperature should be employed and more friction exercised. After this a compress wrung out in cool water may be placed over the abdomen. This should be carefully covered with flannel and its application overseen with the greatest care, and, as a rule, not left to an inexperienced person. If the patient's temperature reaches 103° F., or if nervous symptoms occur, a towel-bath may be given, the patient being covered with a towel, over which cupfuls of cool water are poured, each cupful being well rubbed in, the important thing being to act quickly and stop when the teeth begin to chatter.

When the patient's temperature remains persistently high and bathing facilities are not at hand, the patient may be rubbed with a smooth piece of ice. Each rubbing with ice is followed by a hand-rubbing until the parts glow. Thus successive parts of the body are cooled and rubbed up.

It is important that plenty of cool water should be given to the patient during the course of the fever. Four to six ounces of water at a temperature of 40° may be given whenever desired, and if water is not craved, a regular system of giving draughts of water at certain times should be established. If the system of rubbing and internal administration of cool water be faithfully and regularly kept up, tubs are often unnecessary, even in severe cases. Under this method of treatment it is especially noteworthy that the amount of urine increases very satisfactorily and nephritic symptoms disappear. The system of rubbing is especially of benefit when baths are contraindicated, as in pneumonia or tendencies to hemorrhage.

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### *THE ETIOLOGY AND TREATMENT OF TABES DORSALIS.*

The *Medical Record*, in an editorial on this subject in its issue of January 5, 1901, says that in the prophylaxis of tabes dorsalis the most important measure is the avoidance of syphilis, and, in the event of syphilitic infection, the institution of a thorough and systematic treatment. In addition, care should be taken to avoid constitutional debility, increased irritability of the nervous system, and lowering of its resisting power, and, therefore, all of the predisposing influences. When tabes is already developed, the mode of life should be carefully regulated and made simple and quiet, especially excesses of every kind, and overexertion, being avoided. A spirit of hope should be sustained, and the patient not oppressed with the incurability of his disease. Mercurials should be employed only when symptoms of syphilis are still present, when tabes has developed a short time after symptoms of syphilis have been present and effective antisyphilitic treatment has not been employed, and when the clinical picture exhibits peculiarities indicating involvement of the spinal or cerebral meninges, and the possibility of the presence of actual syphilis of the cord cannot be excluded. Perforating ulcer of the foot is sometimes favorably influenced by mercurial treatment. Not much is to be expected from the administration of potassium iodide, although some of the symptoms, such as pain, are occasionally mitigated thereby. Strychnine exerts a favorable influence on weakness of the bladder, the gastric functions, etc. The salts of silver may also be employed.

Symptomatic or palliative treatment may require the administration of such drugs as acetanilid, phenacetine, antipyrin, pyramidon, sodium salicylate, cocaine, ichthyol, or the use of warm baths for the relief of lanci-

nating pains. The application of a flannel bandage, as well as cold or warm affusions and cutaneous stimulation, appears occasionally to exercise a mitigating influence, and a band firmly applied about the abdomen may ameliorate the distressing girdle sense. Relief may sometimes be afforded by suspension or by extension of the spine by stooping forward. Efforts should be made to avert the crises—of which the gastric are most common—by appropriate hygienic and dietetic measures. Rest in bed, with the avoidance of all irritation, and the employment of anodyne measures and remedies for the control of vomiting, will be indicated. In severe cases morphine will be the only remedy that will afford relief. In mild cases nervines, such as bromides, cocaine, antipyrin, or opium, may suffice. They may be advantageously administered by the rectum. If the paroxysms be long-continued, nutrient enemata may be required. In the intervals the prostration should be relieved by rest, nutritive diet, and tonics. For the weakness of the bladder strychnine and ergotin may be employed, preferably injected subcutaneously in the vicinity of the viscus. To neutralize the bodily weakness small doses of arsenic may be administered. This metal, in appropriate doses, together with rest and a suitable diet, constitutes an admirable remedy for nervous, emaciated, and debilitated individuals. Baths and other hydrotherapeutic measures, climatic treatment, electricity, massage, supporting apparatus, stimulants, are measures that, if they have no direct influence upon the tabetic process, favorably influence certain symptoms, as well as the general condition. Paresthesia may be relieved by the faradic brush, motor weakness by the galvanic and the faradic current, atonic weakness of the back by suitable jackets, and pain by stimulation of the skin. For the ataxic movements, so-called, compensatory exercises may be advantageously practiced systematically, for the purpose of both education and exercise.

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### *A STUDY OF EIGHTY-ONE CASES OPERATED UPON UNDER ANALGESIA OBTAINED BY SUBARACHNOID SPINAL COCAINIZATION.*

Dr. FOWLER, of Brooklyn, gives in the *Medical News* of January 5, 1901, his views as gained from practical experience from this method of using these injections. His own cases are selected ones. Cardiac, renal, and pulmonary lesions have been disregarded for the sake of giving the method an absolutely fair trial. Many of the patients had heart murmurs; not a few were the subjects of degenerative kidney disease; and one, at least, suffered from the gravest of all pulmonary lesions, namely, gangrene of the lung, from which he died a week later. One patient had actual suppression of urine, which was unknown to him at the time of operation. The patient upon whom amputation at the hip-joint was done was an exceedingly weak and feeble old woman of sixty-eight. The patient upon whom Albert-Frank's gastrostomy was done was a half-starved subject with occlusive carcinoma of the esophagus and esophagotracheal fistula. The case of tuberculous peritonitis was in a patient far advanced in the disease and greatly emaciated, and in whom an incision from the ensiform cartilage to the symphysis pubis was made. It was necessary to extend the incision upward in order to reach a gastric ulcer which he had suspected to exist, and which he saw perforate through a small and distinctly circumscribed gangrenous patch upon the anterior stomach wall just as the edges of the incision in the abdominal wall were retracted. The case of tuberculous ulceration of the thigh was that of an exceedingly feeble old man of sixty-three, upon whom double castration for tuberculous testicle had been previously performed. The amputation of the leg was done on an old and feeble woman of sixty-nine, with arterial sclerosis, gangrene of the foot and ankle, and the dry tongue and low mental condition of septicemia. Another case was one of advanced degenerative disease of the spinal cord itself. The ectopic gestation was in a woman who had lost a large amount of blood. The nephrectomy patient was thoroughly septic and died in ten days afterward of general exhaustion and pyemia, the autopsy showing old foci of infection in the remaining kidney. The inguinal colostomy was done on an extremely feeble old man with advanced cancer of the rectum, with albumin and hyaline and granular casts in the urine. Time, however, does not allow him to refer to these at greater length. Suffice it to say, however, that these patients, in whom a general anesthetic was unsuitable in the judgment of any surgeon, showed, as a rule, less pronouncedly alarming effects from the spinal cocainizat on than many of the younger and far more vigorous subjects in his list.

Dr. Fowler has endeavored to employ anti-

pyrin alone, following the suggestions of Nicoletti, of Naples, who reported at the Paris Congress some successful experiments with this drug upon dogs. In the first case he was not sure of its analgesic effects, owing to the fact that the patient was a stoical Italian woman who spoke no English. In a second case this drug failed entirely. A combination of antipyrin and cocaine seemed to give somewhat better results proportionate to the amount of cocaine employed, so far as the analgesia was concerned. Dr. Fowler states that he is not prepared to say at this time just what advantages may be derived from endeavoring to lessen the amount of cocaine by using a mixture of this with other agents. Up to this time the after-effects of these mixtures, as well as those following the injection of fluids other than cocaine, have not been less than in cases in which cocaine alone was used.

In closing, he states that, in spite of his favorable experiences with spinal cocainization, he holds to the proposition that the ideal anesthetic agent is one which, with absolute safety, will render the patient entirely oblivious, not only to the pain of the operative procedure, but to each and all of its disagreeable features as well, including knowledge of the surroundings, the fear and prolonged dread of a fatal result during the operation itself, this being possibly enhanced in the case of a patient fully conscious by the thought that his life hangs upon the point of the surgeon's knife, and that the slightest movement involves the greatest danger. These, together with the disagreeable incident of vomiting, to say nothing of the disgusting occurrence of involuntary urination and defecation while upon the operating table, should be eliminated from the conscious environment of the patient, whenever possible with absolute safety. These propositions are self evident in all cases, but are particularly true in surgery. In obstetric practice, on the contrary, even in the case of a primipara, the patient is more or less prepared, by long looking forward to the important and crowning event of her maternal instinct, for not only painful but disagreeable, and what under any circumstances cannot but be disgusting, features of that event. Not so in surgical practice, in which the announcement of the necessity for an operation is a shock in itself, from which the patient scarcely has time to recover before being called upon to undergo the ordeal itself. While, in certain exceptional instances, the patient will dread the enforced loss of consciousness, the greatest fear on the part of the latter arises from the supposed dangers incident to the anesthetic agent. Take away this fear, and the positive promise of an absolutely harmless nepenthe will far outweigh the suggestion of an experimental analgesia.

Dr. Fowler states that he is impelled to make these remarks by a consideration of the matter from the standpoint of the patient's own feelings, a point of view which cannot be ignored. That the ideal anesthetic has not yet been discovered is unhappily only too true; but he is persuaded that this much-to-be-hoped-for event will come along the line of thought suggested by general rather than local anesthesia or simple analgesia, and through an elimination of all the disagreeable features of the surroundings, rather than a more or less transient suspension of the pain-transmitting function of the nerves involved in the operation.

At the present time we may only say that Corning's method has an undoubted sphere of usefulness in surgery. The indications for and limitations of, as well as whatever danger may attend, its employment can only be determined by further trial and careful study of a large number of cases.

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### *THE SURGICAL TREATMENT OF PUERPERAL SEPSIS.*

*Obstetrics* for December, 1900, states editorially that the marked differences of view held by obstetricians and gynecologists as to the question of operative treatment of puerperal infection are in no way due to confusion over what may be the proper surgical procedure in a known pathological process, but to a want of diagnosis. There might be no opposition to the question of hysterectomy for the uterine body and adnexa, which are filled with many pockets of pus that cannot properly drain into the cavity of the organ; nor for free puncture and drainage of purulent infiltrations of the broad ligaments and neighboring parts; nor to flushing and drainage in certain conditions of peritonitis; but the worry of the profession at large is to know when these conditions exist. In truth, it is the worry of the operators, who would be leaders as well. The most remarkable feature of present writings on this question is not what is said, but what is not said, in the arguments brought forward. There is a constant suggestion of the old nursery say-

ings, such as "First catch your hare," and "You can easily catch a robin if you only put a little salt on its tail." Operate, yes; but when? In certain forms of infection speed is objectionable—*i.e.*, in the infiltrating cellular variety; in another form delay is fatal to success, in the *foudroyante* type, in which the germs fly like winged messengers along the tracts of the lymphatics or veins.

It is a very small percentage of cases of puerperal infection that ever requires operation; therefore it is a very small percentage of cases on which we operate in which the diagnosis is actually obtained before the exploratory incision is made. We come, then, to the question of whether an exploratory incision in cases suspected of being in need of operative measures will be so free from danger as not to produce a greater mortality than follows in cases treated by non-operative methods. This question is not being treated as fairly and impartially as it should be. There are a number of physicians, more gynecologists than obstetricians, who have had relatively little experience, and have not therefore a proper sense of the conservative tendency of these cases to recovery, who discuss the needs of operation in isolated sample cases, and to the satisfaction of all in this respect, but who do not weigh the dangers from operation in their true balance against all cases. Nor are they at all clear in determining how to make the diagnosis. To undertake to forestall the general distribution of streptococcic infection is most desirable, but are we to operate every time we think a case is moving to such a form? We have had many cases that so threatened which did not become systemic, and if we had operated we might easily have increased the mortality instead of preventing it. To the obstetrician who treats his cases carefully, as in a large hospital service, and who has every opportunity to watch them in all their varying moods, two views are forced upon him—that very few cases prove the need of operation, and that the argument of the bedside is strong for conservatism.

The most crying need of the hour is differential diagnosis. Examinations of the vagina, cervix, and secretions of the uterus and vagina for exact bacteriological knowledge of the infection, when made promptly with the beginning of symptoms, will enable us to check many cases by direct local applications. An exact knowledge of the character of the labor through which the patient passed will help in learning of actual conditions. Thus some cases suggest the presence of thrombi in the sinuses because the patient had an exhaustive labor with hemorrhage from the placental side, and final cessation of the bleeding through general circulatory weakness; or she had prolonged stasis of the head at a given point which suggests possible necrosis of a small part of the uterus with underlying germ growth in the line of separation; or she had become very edematous before delivery, with dryness of the vagina and vulva, a condition bringing the tissues into a most favorable condition for infection and its rapid extension; or she has had secondary postpartum bleedings with probable formation of blood-clots in the cavity which may not be expelled until they have softened by decomposition. All such conditions indicate the lines of surgical treatment, and are very helpful to diagnosis when known. There is a great field here for further investigation as to the individual behavior of the several germs which produce infection. Our present knowledge is very limited, considering the importance of the field. We need reports of a thousand cases of gonorrheal infection alone, of the streptococcic infection, and of each of the others, and also these in combinations, with extended study of their characteristics. Such cases in large numbers will, in all probability, bring out little peculiarities of habit and idiosyncrasy of the several tribes of microbes. We will have such information ere long, for many obstetricians are accumulating such data. We have tried to conquer puerperal infection by a master-stroke; we have tried to treat it specifically by a number of remedies, and they have all failed us. We may find a specific, but our present duty and opportunity is to accumulate all possible data of exact reports of many cases of infection.

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### *LOCAL USE OF GUAIACOL IN THE TREATMENT OF FREQUENT PAINFUL URINATION.*

J. HAWES, of Greeley, Colorado, states in the *Journal of the American Medical Association* of December 29, 1900, that he wishes to present guaiacol as a remedy for the treatment of painful urination, which, so far as is known, has not been mentioned in the therapeutics of this annoying disorder.

Frequent urination is a symptom of various affections, but guaiacol is applicable only to those cases in which the cause of the symptom is located in the extreme inner portion of the urethra, usually in a space ¾

to 1¼ inches external to the urethrovesical orifice. Many diseases of the genito-urinary system cause urgent micturition, yet it is probable that all other causes combined furnish fewer cases of frequent painful urination than the one condition under consideration.

Hawes believes that disease of the deep urethra is usually mistaken by the majority of general practitioners for cystitis or "irritable bladder," and is quite sure that nearly all the cases which years ago he himself called cystitis and irritable bladder were not such. He suspects that most of the cases treated with buchu, rhus aromatica, uva ursi, belladonna, etc., and called cystitis, should be called disease of the deep urethra and treated locally.

The morbid condition is usually confined to the mucous membrane and submucous tissues. In almost all cases there is a heightened color of the mucous membrane, varying between a rose pink and slight purple, some cases presenting a granular surface. The diseased part will often bleed on touch. There may be, and usually is, some uneasiness about the base of the bladder, and when the desire to urinate is decidedly present, the discomfort is marked, nagging, and exceedingly uncomfortable.

It is only necessary to place the positive physical signs and symptoms of cystitis, diseases of the prostate and kidneys, gonorrhea, contracted and adherent prepuce, stricture of the urethra, etc., in contrast with the physical signs of inflammation of the deep urethra, to put the physician on his guard against confusing these diseases. The writer has called attention thus briefly to some of the symptoms and signs of deep urethritis to emphasize the fact that it is often mistaken for other diseases.

The diagnosis having been settled, an ordinary urethral speculum of a caliber as large as can be borne with comfort should be passed through the deep urethra. With absorbent cotton on a cotton-carrier the mucus at the bottom of the speculum should be taken up, and if any blood has filled the lumen it should be mopped away until the mucous membrane is dry. Another carrier, having a small ovoid of cotton on its point, nearly saturated with guaiacol, may be used to make applications to the congested membrane.

Guaiacol in a fluid condition should not be permitted to cover the mucous membrane; barely enough to make a surface application is all that is desirable; thus applied it is an anesthetic and mild stimulant. It gives rise to much less pain than the usual local applications. No strangury results, as is usually the case when silver nitrate is used. The patient will often retain the urine for hours after the application. Its use is often followed by a lessening of the perineal and suprapubic discomfort after a few hours, and a few applications, from five to ten days apart, have been more satisfactory to patient and physician than any remedy previously used. It has cured twenty per cent of the writer's patients. About seventy per cent of the cases are improved markedly. Some cases that would seem to fall fairly within our field are not improved. If applied every day or two it will produce local tumefaction, causing a diminished size of the urinary stream; this tumefaction passes away in a few days.

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### *ALKALOIDS AND THEIR ACTIONS.*

W. MURRELL states in the *Medical Press and Circular* of December 19, 1900, about the advantages of alkaloids. He tells us that there is one important point to remember about alkaloids, which is that many so-called alkaloids are not pure alkaloids, but simply a mixture of alkaloids. Daturine is commonly said to be the alkaloid or active principle of *Datura Stramonium*, but as a matter of fact there is no such substance as daturine. What is sold as daturine is simply a mixture of atropine and hyoscyamine. Recent researches have shown that atropine and hyoscyamine are one and the same body, prepared from different plants and by different processes, from which it follows that daturine is simply atropine under another name. There are many examples of this confused nomenclature; for example, duboisine is simply hyoscyamine, in other words atropine. Pituri, obtained from *Duboisia Hopwoodii*, is simply nicotine, and the list might be extended almost indefinitely.

Dr. Murrell states that he is often asked to indicate what in actual practice are the most valuable alkaloids, and if he had to draw up a list of a dozen, the following would be his selection:

1. Morphine. This is the chief and most important alkaloid of opium and represents its physiological activity. It matters little which of the salts of morphine is employed—the hydrochlorate, the acetate, the sulphate, or the tartrate, all being active. They allay

pain and spasm and induce sleep. Small doses of morphine frequently repeated are of the greatest value in allaying the cough of early phthisis. Codeine is simply a weak morphine, and if we have the primary and more active alkaloid we can readily dispense with the services of the weaker brother.

2. Quinine. This is commonly given in the form of sulphate dissolved in water, to which a little dilute sulphuric acid has been added, as many minims of the dilute acid as there are grains of the sulphate of the mixture. This forms a perfect solution. In two-grain doses three times a day it is a useful tonic, while in larger doses, ten or fifteen grains or more, it is by far the best antiperiodic and is of great value in malaria, supra-orbital neuralgia of malarial origin, and a number of similar diseases.

3. Atropine. This is the chief alkaloid of belladonna and some allied species, and will check the night sweating of phthisis and other forms of hypersecretion. It may be given either by mouth or hypodermically, and in the latter case a single dose of one-sixtieth grain, or even less, will usually effect a cure. Its action in dilating the pupil, and its value in iritis, syphilitic or otherwise, are well known. Its derivative, homatropine, is undoubtedly useful, but in the hands of a skilful physician the major alkaloid will effect all that is necessary.

4. Strychnine. This, the chief alkaloid of nux vomica, is always found in conjunction with brucine. It is most useful as a nerve tonic, and is usually given in acid mixtures. Employed hypodermically in doses of one-twelfth of a grain once or twice a week, it improves the nutrition of the muscles and restores warmth to the limbs in infantile paralysis, and in many cases of chronic hemiplegia. Brucine is comparatively rarely employed, and would only be indicated in the absence of strychnine.

5. Pilocarpine. This alkaloid has many advantages over the crude drug jaborandi. Administered hypodermically in doses of from one-third to one-half grain, in the form of the nitrate or the hydrochlorate, it induces profuse sweating or salivation. The patient should be in bed at the time in a warm room, and between blankets. In the initial stages of a cold, and in many forms of Bright's disease, it is invaluable.

6. Aconitine. The active principle of aconite is of use in many forms of obstinate neuralgia, such as tic douloureux. It is difficult to give definite directions with respect to dosage as different "makes" of this alkaloid differ enormously in activity, but with the very best aconitine, $\frac{1}{210}$ grain in pill, three times a day, a definite physiological action should be induced. As a local application the ointment of aconitine is most useful, but a certain amount of care must be shown in its employment. A piece not larger than a bean should be rubbed in, and care should be taken that it does not come in contact with an abraded surface or with the mucous membrane of the eyes or mouth.

7. Apomorphine. This is a derivative of morphine, and is obtained by heating morphine hydrochloride or codeine hydrochloride in sealed tubes with hydrochloric acid. The hydrochloride is the salt in use. Given hypodermically, it is the most powerful emetic known. It will completely evacuate the contents of the stomach in less than one minute without producing cardiac depression. The ordinary dose for the purpose is one-tenth of a grain. Given by mouth it produces neither nausea nor emesis, but acts as a powerful expectorant. The dose for this purpose is from one-tenth to one-fourth grain. If the 1-to-100 solution is employed, it may be made into a linctus or mixture with syrup of tar. Apomorphine speedily gets darker on being exposed to light, but this change in color in no way impairs its efficacy. It may be prevented by the addition of a drop or two of dilute hydrochloric acid.

8. Physostigmine or eserine contracts the pupils when applied locally, and is invaluable in ophthalmic practice. Its chief use is in the treatment of glaucoma. For internal administration we have the hydrobromate, salicylate, and sulphate, which in doses of one-sixtieth to one-twentieth grain have been used with benefit in tetanus, chorea, and in chronic cases of paraplegia.

9. Cocaine. The use of cocaine as a local anesthetic is so well known that it is hardly necessary to say anything about it. It is difficult to know what one should do without so useful a remedy. One of its most valuable properties is that of dilating the pupil. Of course, it has its disadvantages, and many substitutes for it have been introduced—eucaine B, for example—but it still holds its own.

10. Caffeine is only a weak alkaloid, but it forms salts which are more or less stable. The citrated caffeine is a good diuretic, but its chief use is in the treatment of neuralgia and the various forms of migraine and sick-headache. A combination much affected by

the laity is four grains of phenacetine with one grain of citrate of caffeine. Phenacetine even in these doses is not a particularly safe remedy, and is apt to give rise to cyanosis, dyspnea, and other disagreeable symptoms.

11. Gelsemine. By gelsemine is meant the pure alkaloid, a yellowish-white microcrystalline powder. It is not the same as gelsemin, the powdered alcoholic extract, which is of a pale brown color, and is much less active. The alkaloid is usually given in doses of one-sixtieth grain, often in the form of a pill, with sulphate of quinine or butyl-chloral-hydrate. It is an admirable remedy for neuralgia, especially the form affecting the lower branches of the fifth nerve.

12. Colchicine. The alkaloid of *Colchicum autumnale* is far less appreciated than it ought to be. It is a very active remedy, and a dose of one-sixtieth grain three times a day is ample. An excellent pill is composed of one grain of calomel and one-sixtieth of colchicine. As a rule it does not purge if given three times a day, but very speedily affords relief not only in gout but in that far more common affection which we call goutiness.

The intelligent physician, armed with these twelve alkaloids, and knowing how to use them, would be in a position to treat almost any medical case that might fall to his lot.

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### *THE TREATMENT OF ACUTE COLDS.*

M. B. STEWART states in the *Medical Bulletin* for January, 1901, that many acute colds have their onset by a slight localized burning, stinging, or itching sensation in the throat. If it is possible to treat at this stage, paint the spot with pure glyceritum acidi tannici, or a solution (gr. x to ℥ j) of argenti nitras. Follow this by two grains of bisulphate of quinine, two grains of acetanilid, and a cup of hot tea, milk, or water, and the case is usually aborted. Many cases are aborted by the painting alone. If this burning sensation is allowed to continue for six or twelve hours, more decided measures are necessary, as the throat becomes sore, or there is a marked coryza developed, or general pains and constitutional symptoms. Any therapeutic agent that will tend to equalize the circulation or render the emunctories active will materially assist; hence the virtue of a dose of castor oil, calomel, blue mass, or other purgatives. It is well to have free catharsis at the beginning of active treatment.

For the nervous type with general aching, headache, fever, chilly sensations, and flashes of heat, some sore throat, and cough, it is Dr. Stewart's custom to give a tablet containing:

℞ Quininæ bisulphatis, gr. j;
Acetanilid, gr. j;
Cocainæ hydrochloratis, gr. 1-16.

Signa: One tablet or capsule every hour for four consecutive hours, then every two hours. Give half a cup of very hot water or milk after each dose.

Put your patient in bed for best results. Most cases of this type respond promptly to this method; but, if the congestive headache still continues, give a hot mustard foot-bath and put a mustard plaster to the back of the neck. If the cough is dry and irritating, give codeine gr. $\frac{1}{16}$, or heroin gr. $\frac{1}{20}$, with the tablet, but not combined with it, for neither narcotic is needed when the cough is controlled.

For the catarrhal type with running nose, suffused eyes, some cough, and sore throat, give

℞ Quininæ bisulphatis, gr. j;
Camphoræ, gr. ¾;
Extract. belladonnæ, gr. ½.

Misce. Pone in tabellæ vel capsul. No. j. Signa: One every hour for four or five hours, then one every two hours.

Follow the same general rules as in the nervous type. Good results can also be obtained from the T. G. Davis fever tablet (tr. aconiti, ♏ $\frac{1}{8}$; tr. belladonnæ fol., ♏ $\frac{1}{16}$; tr. bryoniæ, ♏ $\frac{1}{16}$) given every fifteen to thirty minutes and allowed to dissolve in the mouth. As soon as the physiological effects of the belladonna are felt lengthen the interval to one or two hours. In children melt six or eight of these tablets in thirty teaspoonfuls of water, and give one teaspoonful every twenty to thirty minutes until results are obtained. Inhalations of menthol, camphor, or turpentine are beneficial. Better still, spray the nose and throat frequently with:

℞ Menthol, gr. x;
Camphoræ, gr. xv;
Olei eucalypti, gtt. x;
Albolene, f ℥ ij.
M.

Cosmoline used freely in the nose is also useful to relieve soreness and excessive secretion. When there is sore throat the following gargle is most serviceable:

℞ Glyceriti acidi tannici, f ℥ j;
Acidi carbolici, gtt. xv;
Glycerini, f ℥ j;
Hydrogen dioxide, q. s. f ℥ iv.
M. Signa: Two to four teaspoonfuls to ¼ glass of water, and gargle every fifteen minutes to one-half hour.

If to this method is added an ice-bag applied to the throat in selected severe cases results are prompt.

One frequently meets with a mixed nervous and catarrhal form of cold. Alternate each hour between the acetanilid and camphor pill before mentioned until the nervous symptoms subside, then discontinue the former and give the camphor pill every two hours. Very few colds in their first stage will fail to give prompt response to this treatment. Dr. Stewart's success with large doses of Dover's powder has been poor, but some cases will undoubtedly respond to it. There is a class of individuals in whom abortive methods will not act even at the very onset, but many of these will be found to neglect some detail or expose themselves to further infection.

Most cases of acute colds will come to us when they have passed the stages outlined, or maybe we have treated with little result and the cold has progressed to a bronchial type with a hacking, dry, burning, or painful cough and pain in the chest. Immediately apply mustard over the painful or affected area. Best results are obtained from a home-made mustard plaster of one part brown mustard and three parts flour mixed with tepid water or egg albumen. This modified plaster can be kept on for hours with no danger of blistering, except in very sensitive skins. In the latter case anoint the skin with cosmoline or lard before applying the plaster. In young children it is better to use free inunctions of camphorated oil, turpentine, and lard, or coal oil, applied hot from two to three times daily. In fact any good counter-irritant to the chest is good. Internally give:

℞ Vini antimonii, f ℥ jss;
Ammonii bromidi, ʒ ijss;
Liq. ammonii acetatis, f ℥ ijss;
Syr. limonis, q. s. ad f ℥ iij.

M. Signa: One teaspoonful in water every two hours.

Use this combination each alternate hour with the camphor pill or acetanilid pill as indicated. In simple colds use the mixture alone. There is no one working formula that gives as much satisfaction as this. The antimony will reduce heart action without depression, relieve congestion, and start bronchial secretion. The bromide will relieve harassing cough and any nervous symptom, will assist in controlling the heart, and acts locally as a sedative to the throat. Liquor ammonii acetatis will render the skin and kidneys active, and soon bring on free bronchial secretion. Syrup of lemon is the best vehicle, and next to it is mistura glycyrrhizæ. This formula should be varied in strength according to the demands of the case. It is sometimes well to substitute codeine, gr. $\frac{1}{8}$, or heroin, gr. $\frac{1}{30}$, for the bromide to control cough. Opiates, as a general rule, retard recovery, but should never be neglected if the cough is not easily controlled. Continue this method until all congestion disappears, when it is wise to follow with a good preparation of hypophosphites or cordial or emulsion of cod-liver oil. Should the case be a depressed old person this same combination can be given with perfect safety, but it is well to give five to ten drops of aromatic spirit of ammonia, well diluted with water or milk, every three hours, at a separate dose. Ammonium chloride, in the writer's experience, is very much overestimated and disappointing. In most cases the cough is eventually "tightened" and aggravated. Its one main use seems to be to disorder the stomach and depress the appetite. Other ammonia preparations are much better when indicated.

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### *THE CONSENSUS OF JUDGMENT WITH REFERENCE TO THE TREATMENT OF TUBERCULOSIS.*

Writing in the *Medical News* of December 29, 1900, DENISON reminds us that the preference for high altitudes to which those who have had experience in Colorado are wedded rests upon their personal knowledge of remarkable results. They believe these results could not or would not occur under other and low altitude conditions, except as a rarity. Yet if we were to average the whole profession's opinion on this point we would be outvoted by those who imperfectly understand and who poorly appreciate the chief factor of their climate, viz., the physical effect of the rarified air upon the lungs and heart—the pulmonary air and blood circulation. That the inactive, sedative, and confined life in the lowlands has its counterpart, proportioned to the rarefaction of the air, in the active, stimulating, and open life of our interior altitudes is a plain proposition which seems to be poorly understood by the majority. They have "heard tell," but they do not see it clearly that the periphery of the body is somewhat congested in the high altitude due to the crowding of the greater amount of air breathed into the pulmonary spaces, aided by the less pressure of the atmosphere on the surface of the body.

That there is always a reciprocal relation between the blood in the thorax and the air in the lungs does not seem easy to understand according to the reasoning of the advocates of the rest cure, which seems to be the favorite method with the majority of physicians. We are, or seem to be, under a spell of uncertainty, if not of fear—a practical acknowledgment of our inability to properly cope with this lethargic disease. Since the evidence of cures, by whatever method or climatic change produced, is so generally believed to be confined to the incipiency of "first stages" of the disease, Denison suggests a test suited to this period. It is recommended for the consideration of those gentlemen who come in contact with large numbers of consumptives in their capacities as organizers or governors of proposed sanatoria for large cities in the East. The trial Dr. Denison suggests would not only be of incalculable value to these men in the management of their institutions, but the preeminent superiority of an outdoor life in their high altitudes would thus be settled.

Let these gentlemen choose, or have selected by careful physical examinations, one-tenth of any 500 or 1000 consumptives who come under their notice. This choice is to be based upon the fitness of these supposedly tuberculous persons for the active outdoor life proposed, and limited to those who are on the favorable side of the breaking-down period in pulmonary tuberculosis. These fifty or one hundred invalids, preferably young men, are to be under the care and control of a selected physician. If he also needs this kind of life it would not greatly matter, provided he had the initiative and enthusiasm to make his mission a success. Then a hospital tent with one or more spring wagons, for transporting invalided members, should also be provided; also a commissary and cook and sufficient aid to have the party live well; also a large mess tent which should give shelter in case of storms, and freight teams for carrying same and each one's individual luggage. Other tents might also be provided, but the main idea would be to have these young men sleep out in the open nearly all the year round. In order to do this safely, he recommends each man to have an "outfit" such as the cowboys have on the large cattle ranches in the Panhandle of Texas.

Such a movable camp could outfit from one of the cities at the eastern base of the Rocky Mountains in Colorado, and start out, say, in June, expecting by easy stages—ten to twenty-five miles a day when on the move—and by prolonged campings at desirable places, to reach some southern point (as, for instance, the south slope of the mountains north of Tucson, Arizona) by the first of December. Here a winter camp for three or four months might be provided with added provisions, perhaps temporary cabins, to meet the season's requirements. After this a return north by a new route could be undertaken, including unfrequented and interesting sections of western Colorado, with the object of disbanding, say in Denver or thereabouts, the following October or November.

Now, under a right personal and financial organization, and a careful and conscientious choice of invalids to make up such a party of fifty to one hundred, Denison believes the results would be better than could be produced by any other at present known system or method of treatment. From the workings of such a plan it would not be difficult to conceive how changes could be made, so that it would be possible to include the care of the more seriously ill, even to the extent of having nurses along. Again, permanent camps or ranches might be established in connection with gardening, cattle- and sheep-raising. For instance, three camps five to fifteen miles from each other might be established at different elevations to suit the winter, spring and fall, and midsummer seasons; the tents with board floor being moved from one to the other. Thus, an elevation of two to four thousand feet higher in summer than in winter could be secured. Such places have the additional advantage of fine exposure and good water, and could be found in New Mexico and Arizona, where considerable tracts of land could probably be bought very reasonably for this purpose—but these suggestions are diversions from the main object of this paper.

The other difficulty we have to contend with in eradicating tuberculosis is the fact of the consensus of judgment among medical men hovering so closely around the germ cause that the predisposing conditions (without which the disease could not exist) go undetected, and the greatest possible success cannot be obtained. In Dr. Denison's paper upon "The Degenerative Results of Deficient Ventilation," read at the last meeting of the American Climatological Association, he has so fully worked out the proof that we as a people are living upon a deficient ventilation curve, and that this defect in our

civilization is at the bottom of our prevalent tissue degeneration and tuberculous tendency, that he may be pardoned for referring thereto for the detailed argument. The conclusion therein reached was that the healthful respirability of the air depends upon its not having been previously breathed or shut off from the revivifying influence of the sun; in other words, that the electrifying, purifying, and motion-producing influence of the sun cannot be shut out from the air we breathe without a resultant vitiating effect upon the blood and tissues, in the lungs especially. Thus, the air is rendered unfit for respiration, and here is the main source of the dyscrasia or degeneration which makes the destructive activity of the germ possible.

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### *THE NITRITE TREATMENT IN SYPHILIS.*

BROWNING writes in the *Medical News* of December 29, 1900, on this subject, and expresses the belief that in gumma of the brain or cord the nitrites help materially to get the desired rapid action of mercury and iodides.

Specific troubles outside the central nervous system, especially when accompanied by pain, may be thus favorably influenced. For instance, in the recent case of a young man with known hereditary taint, the symptoms of a sharp first attack of appendicitis yielded readily to this means after complete failure of the ordinary remedies.

The nitrites are indicated in all syphilitic diseases of the arteries, as a rule in all specific affections attended by pain, in all syphilitic brain troubles, and especially in the later and hereditary forms of syphilitic disorder (cerebral, spinal, peripheral). This groups clinical indications rather than differentiates them, but for present and practical purposes it may suffice. With these indications goes the mandate to immediately employ such other and more directly specific agents as the case demands. The title of this paper is intentionally made use *in* syphilis, not *for* syphilis. It is understood that the glycerin and erythrol preparations are nitrates; but it is what is known physiologically as the nitrite action that is developed, and hence that term is used in this article.

In the use of the nitrites certain by-effects, in general unpleasant, are met with more or less frequently. The frontal pressure, fulness of the head, and even headache, are presumably inherent if we succeed in getting the desired physiological action, no matter which preparation is employed, and hence we may not expect in any way to materially avoid them. Whether the drug acts quickly or slowly so long as it acts forcibly these secondary effects must be expected. A certain tolerance usually develops, possibly the expression of systemic accommodation. In the case of the rapidly acting nitroglycerin, the head manifestations may be more sudden and transient, but the difference is only one of degree. Not so, however, in the case of the peculiar discomforts that soon become intolerable to many patients. These are evidently due to the decomposition of the nitrite in the stomach.

The nitrite of amyl need not be considered, as its action is too evanescent. Of the other preparations nitroglycerin alone possesses in Dr. Browning's experience practical freedom from this objection (due presumably to the fact that it goes unaltered into the circulation). For that reason this preparation is, for any prolonged periods, the one we are often compelled to employ. Nitrite of sodium may be tried at the start, and in rare cases continued some time. Usually, however, the complaints are soon so urgent that a change has to be made. Some of his colleagues using these preparations find less complaint against them than he does. Since the more general accessibility of the tetranitrate of erythrol he has made considerable use of it. Possibly the gastric complaints are somewhat less or more delayed than in the case of the sodium salt, but there is no great difference in the two on this point. Lethargic and stuporous individuals can sometimes continue it awhile. The employment of this preparation is based on the results obtained by Bradbury (*Lancet*, 1895, II, pp. 1205–1213), who showed that its peculiar nitrite properties are slower and more lasting in their effect, beginning in half an hour and continuing several hours. He recommends doses of a grain or more, given either in solid form or dissolved in alcohol. In his work doses of half a grain are quite sufficient at the start, and even that amount may soon be complained of. Dr. Browning finds that clinically, as was shown by Bradbury experimentally, it does not cumulatively lose its effect, as is the case with nitroglycerin. Its slower action is its most desirable quality.

The desideratum at present is some vasodilator at least as slow and prolonged in its action as the erythrol salt, and at the same time as free from gastric disturbance as is

the glycerin preparation. Doubtless some of our chemists or workers will find an article free from drawbacks, or perhaps some combination in administration that will prevent this without invalidating effectivity. Meanwhile, though we can begin with one of the sugar combinations (mannitol nitrate having also been recommended) or the nitrite of sodium, we shall usually have to fall back on nitroglycerin for prolonged use, despite its lack of needed staying qualities. Occasionally we need at the start a very prompt agent, and then of course nitroglycerin is just in place.

The method of administration is also of importance. For the writer's plan the hypodermic use is quite unsuited. That only makes the action of the nitrite the more temporary, and leaves the course of events unaffected until the next dose. It is moreover often painful, but that is not the essential objection. As nearly a continuous action as possible is what is in order, and for that purpose administration by the mouth answers best. One to two grains of sodium salt is usually sufficient, at least for the earlier doses.

All of these agents are highly explosive if improperly handled. This should be borne in mind in making combinations, a practice not to be recommended when dealing with the nitrites. The sodium salt should be given in solution, while the sugar preparation is available in tablet form.

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### *TREATMENT OF THE GASTROINTESTINAL SYMPTOMS IN TYPHOID FEVER.*

ANDERS states in the *Journal of the American Medical Association* of January 26, 1901, that the following methods are best for the conditions named. For the constipation sometimes present throughout the entire course of the disease, Dr. Anders has found that an enema of soap-suds, given every second day, is followed by the speediest and best results; in late protracted cases accompanied with an irregular intermittent fever, he has seen good results follow the administration of divided doses of saline laxatives. Again, it sometimes happens that a diarrheal condition occurs during the early period of convalescence, due to some irregularity of diet or overabundant feeding, or to a bacillary—otherwise harmless—development, and under these circumstances a mild laxative is sometimes followed by prompt amelioration of the symptoms. In this condition he protests against the routine use of the so-called Woodbridge treatment. He has never seen the gratifying results claimed by its author and his disciples. Moreover, there is no special medicinal treatment for typhoid fever, but there is for the individual case.

Of the group of intestinal antiseptics—salol, benzonaphthol, thymol, carbolic acid, etc.—the author commonly employs salol, the dose being three grains every three hours, or larger quantities, even if the symptoms are above the average severity. It is a compound of salicylic and carbolic acids, insoluble in the normal juices of the stomach, but the pancreatic secretion decomposes it into its constituent elements. Its action is that of an antiseptic; meteorism is diminished, and the stools become less offensive, as has often been observed. The other members of this group of antiseptic agents may be credited with the same action, but the author's personal experience with their use has been quite limited.

For the marked distention of the bowel, especially noted when the colon is the seat of the principal lesions and diarrhea is a prominent feature, turpentine is probably our best remedy; it is an efficient antiseptic and a stimulant to the circulation and glandular system. When the healing process in Peyer's patches is slow and sluggish, turpentine, by virtue of its stimulating action, hastens the repair of typhoid ulcers. For the meteorism white turpentine or the oil may be administered internally; if the stomach becomes intolerant, then enemas of the oil combined with milk of asafetida are very efficacious. As turpentine is eliminated from the system through the lungs and kidneys, and on account of the overworked condition of the last named organ, the drug should be used with great caution, or discontinued on evidence of albumin in the urine. The author quotes Dr. Pfromm as reporting that in a recent case he saw with a brother practitioner, the patient, being in the last half of the second week of typhoid fever, suddenly showed uremic manifestations while taking turpentine; the urine was scanty and contained both albumin and casts; some twitching of muscles was noticed. On discontinuing the turpentine, the urine increased in amount, albumin and casts disappeared in three or four days, and the patient made a good recovery.

The colon or lower bowel is sometimes the seat of extensive ulceration; this is productive of marked tympanites, and at times an ex-

hausting diarrhea supervenes, or involuntary discharges may occur. In these instances intestinal irrigation, if judiciously employed, tends to sweep from the bowel decomposable material and irritating microorganisms. Dr. Anders sometimes combines with the water an antiseptic, as salicylic acid .5 to 1 per cent, or bichloride of mercury 1-to-6000, used thrice daily, or every four hours, according to the urgency of the symptoms. If a decided catarrhal condition exists, silver nitrate .25 to 1 per cent may be advantageously employed.

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*ON THE VASOMOTOR INFLUENCE OF QUININE.*

The *Journal des Praticiens* of December 1, 1900, contains an article by HUCHARD in which he states that Liegeois first called attention to the fact that quinine, when given in large doses, is sometimes of value for the purpose of controlling hemorrhage, and he also recalls the fact that De Mussy as long ago as 1871 reported the treatment of uterine hemorrhage by the sulphate of quinine. Still later, other French clinicians reported the results which they had obtained from large doses in the treatment of various congestions and hemorrhages, in exophthalmic goitre, and in aortic insufficiency with tachycardia. The mixture which has been largely employed for the control of hemoptysis is as follows:

Sulphate of quinine, 1½ drachms;
Aqueous extract of ergot, 20 grains;
Powdered digitalis, 2 grains;
Extract of hyoscyamus, 2 grains.

To be made into forty pills, five or six of which are to be given each day for two or three days.

Other investigators have reported their success in the employment of somewhat similar mixtures in the treatment of metrorrhagia.

In regard to the influence of the drug in exophthalmic goitre, Huchard asserts that it is a valuable vasoconstrictive when given in a pill made up as follows:

Sulphate of quinine, 1 drachm;
Extract of opium, 1½ grains.

Make into thirty pills, and give four or five pills a day.

It is also believed that the addition of antipyrin to quinine distinctly increases its hemostatic power, and it may be prescribed as follows:

Sulphate of quinine, 1 drachm;
Antipyrin, 1 drachm.

Make into eight cachets, and give three cachets each day.

It is, however, in cases of aortic insufficiency with excessive pulsation and palpitation of the heart which can be readily seen in the cervical arteries that quinine is said to be particularly valuable. Under these circumstances Huchard has employed the hydrobromate of quinine in preference to the sulphate, with the thought that it would be more sedative given in the dose of fifteen grains a day. He claims that this method of treatment has given very extraordinary relief to a certain number of cases. Emphasis is laid upon the necessity of obtaining rest for such patients at the same time that the quinine is given.

[The criticism that we offer this paper is that its views are directly in antagonism to those which have been commonly held by American physicians in regard to the influence of this drug. Hirst and others have been inclined to believe that it distinctly increases the tendency to uterine hemorrhage, and others have thought that it increased the tendency to hemorrhage in the kidney. So far as we are aware, nothing that is known concerning the physiological action of quinine would indicate that it has any direct constricting effect upon the blood-vessels, although, of course, by supporting the system and acting as a tonic, it may improve the condition of the patient.—ED.]

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*TREATMENT OF LATERAL CURVATURE OF THE SPINE.*

CHISHOLM WILLIAMS (*Pediatrics*, vol. xi, No. 2, 1901) states that putting aside those cases affected with short-leg or flatfoot, or some easily remedied cause, where the treatment by mechanical or other means would be sufficiently obvious, he can safely state that no five of 500 cases of lateral curvature of the spine were treated alike from "start to finish." He had no case, of whatever degree of so-called osseous deformity, under the age of twenty-five years, in which he was not able to effect some amelioration. By this is meant not only a stronger (if weak) back but a more straight position of the vertebral bodies. It is reasonable to suppose that the intervertebral cartilages must become very "wedge-shaped" before the bodies are much affected, and if the pressure of the bodies on them can be relieved by any means the disks will become thicker, the shortened ligaments longer, and the long lax ligaments shorter, and so help to cure.

Believing that direct muscular exercises

alone do positive harm to the great majority of cases, his treatment was directed to:

1. The patient's general condition; improved by means of fresh air, fresh food, and, as a rule, fresh clothing, made to allow of, more particularly, chest development. Medicinally, by means of the hypophosphites, cod-liver oil, bland preparations of iron, etc.

2. Getting the spinal column straight by means of manual pressure, mechanical pressure, Barwell's rachilysis, Barwell's lateral sling, and Volkmann's sloping seat; also by means of weight pressure.

3. Keeping up the improved position by means of the apparatus prescribed at the City Orthopedic Hospital and devised by the late A. T. Chance. It is an adaptable metal splint and acts chiefly as a spinal extension.

Between the two shoulders is a metal plate, having attached to it two straps which pass through the axilla and brace back the shoulders; it is joined to a perpendicular slotted rod which passes downward to a crescent-shaped metal band (pelvic girdle) joined in front by a strap and situated on a level between the crest of the ilium and great trochanter; over the convexity of each curve a plate is accurately adjusted by means of short metal arms which connect the plates to the perpendicular rod. A broad abdominal belt completes the splint. All parts in connection with the skin are thickly padded. Accurate adjustment is made by means of wrenches and a key for the nuts. The curved plates can be moved up and down and laterally and then fixed by the key, whilst greater nicety of position can be obtained by wrenching the short arms or the rod. At the first sitting the splint must fit perfectly, and from time to time be altered as improvement progresses, readjusted, and the better position kept up. It does not fix the column as in a vice, but always allows of a slight amount of muscular action which is sufficient to bring about a lessening of the curves in the great majority of cases, more especially when combined with other means. The patient should be directed to "get away from the plates," as every time she does so she is in a better position, and when she drops back cannot resume a more faulty position than the splint will allow. When this becomes somewhat habitual the splint must be again readjusted, and so on, until the cure is complete. It should be worn, as a rule, at all times, night and day, and only taken off for douching and exercises. In extremely severe cases, where cure is out of the question, the splint is of the greatest comfort to the patient, and prevents any increase of the deformity. Adaptability, lightness, cleanliness, durability, and great efficiency are its chief merits.

Under the age of five years a leather or gutta-percha splint, suitably padded, is sufficient to overcome the curves.

4. Special exercises were ordered for each weak muscle or group of muscles until the spine was straight; then general muscular exercises were given to assist in keeping it in position.

5. Other aids were massage, galvanism, and rubber exercisers.

The ease with which any case of lateral curvature of spine is treated depends on the following:

1. Intelligence and willingness on the part of the patient.

2. The care and help of parents or friends.

3. The assistance of the surgeon.

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### *A CASE OF OBLITERATION OF THE RIGHT URETER BY A CALCIFIED FIBROID; REMOVAL OF FIBROID AND IMPLANTATION OF THE URETER INTO THE BLADDER.*

RICHARDSON (*Boston Medical and Surgical Journal*, vol. cxliv, No. 4, 1901) operated on a woman suffering from an abdominal tumor. On exposure the tumor proved to be a fibroid of the uterus, upon which, or a part of which, was a large cyst. The tumor was either a fibrocyst of the uterus, or a uterine fibroid in close connection with a cyst of the broad ligament. It was deeply and broadly attached, and separation seemed impossible. The deeper portions in the right side of the pelvis were evidently calcified, being of stony hardness.

Separation of the tumor became more and more difficult as the calcified portions were reached. The areas of the tumor deep in the right broad ligament were closely attached to the right and anterior portions of the pelvis. Separation was made with the fingers carefully pressing between the capsule of the tumor and contiguous structures. When the solid and calcareous masses were reached, enucleation became still more difficult. It was at this point in the operation that clear fluid was noticed escaping rapidly and in large amounts from the depths of the dissection.

The orifice from which this fluid was flowing was easily recognized and its edges grasped. Dissecting backward, it was found to be the right ureter, which apparently ended at the separated calcified masses. Beyond this point, which was perhaps an inch or more from the bladder, no distal orifice of the ureter could be found, though most careful search was made for it. Above the orifice the ureter was dilated and tortuous, and the pelvis of the corresponding kidney much dilated. It was supposed that the injury to the ureter was caused by a transverse tear, the ureter being presumably situated at an angle with the plane of the separated surfaces. It seemed, however, perfectly evident, finally, that the ureter ended at the plane of cleavage, and that separation at that plane tore across the obstructed end. However that may be, the problem was not unlike that of a divided ureter, except that end-to-end suture was impossible, for no distal end could be found. It was fortunate perhaps that end-to-end union was impossible, for such an operation deep in the pelvis is not likely to succeed. The proximal end for one inch or more was freed from the resisting tissues in which it was embedded until it could be brought easily to the collapsed bladder, into which about half an inch of the lax ureter was thrust. The bladder about the ureter was then carefully and accurately sutured to the side of the ureter, the end of which was of course projecting about half an inch into the bladder. The sutures were of fine silk applied interruptedly. Separation of the tumor at the left soon demonstrated that it made a part of the sigmoid flexure. Removal, therefore, left a gap in that viscus, which was closed by a few silk sutures.

The whole operation was extremely difficult. Had not the ureter and the bowel been involved, enucleation of the tumor itself would have seemed sufficiently formidable. With the added complications, recovery seemed too much to expect. Fortunately, the most unpromising cases often do the best, and this was one of them, for convalescence proved—to use a much overworked word—uneventful.

The author's plan in pelvic surgery has made operations of ureteral repair extremely infrequent. This plan, which has everything to commend it, is to make the dissection of the deep pelvis, like that of the deep neck, in the full light of day, where every structure can be recognized as the dissection proceeds. The cases in which this deliberate dissection cannot be made, or in which the structures are too changed for recognition, are extremely infrequent.

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### *REMARKS ON THE TECHNIQUE IN DEALING WITH THE PEDICLE IN THE REMOVAL OF INTRAPELVIC GROWTHS AND STRUCTURES.*

Dr. RICHARD R. SMITH (*American Journal of Obstetrics and Diseases of Women and Children*, December, 1900) reports that during the past two years a considerable number of cases have come to his notice in which he believes an improper treatment of the pedicle in work upon or involving the appendages has led to unpleasant results. These women had all been operated upon, and a tumor or diseased tubes and ovaries (a part or all) had been removed. It has brought forcibly to his mind the necessity of a proper technique in removing pelvic structures or growths, if we are to expect to prevent in our patients those unpleasant after-symptoms which have spoiled so many otherwise satisfactory results.

The faults usually committed are three: (1) Use of silk; (2) ligating tissues *en masse;* (3) leaving too short a pedicle. In consequence we have left a condition about the stump which results in persistent pain, rendering the patient often more miserable than the original disease.

1. Use of silk. Silk has been replaced by catgut in the hands of most operators. It may be securely tied with a little more readiness than catgut, but care in tying the latter makes it equally as safe as silk. The use of enormous silk ligatures for the securing of the vessels the size of the ovarian or uterine seems entirely uncalled for. The fistulæ which have followed the use of these ligatures have been not only a source of distress, but have been the cause of death in not a few instances where operations have been undertaken for their removal. Aside from this, silk ligatures add greatly to the induration and adhesions about the stump, and so cause pain.

2. Next to the use of silk in its bad effects comes the method of including in the ligature large masses of tissue. This may be not only a cause of many dense adhesions, but by drawing together the structures of the broad ligament the uterus may be displaced.

3. In removing tumors it has commonly been the habit of most surgeons to tie off the pedicle close down to its origin. In doing

this considerable tissue has been drawn together, the broad ligament has been shortened, and in consequence the uterus eventually drawn from its normal position. When the pedicle is very short, or when there is really no pedicle at all, by cutting close to the tumor puckering of the tissues may be avoided, the bleeding controlled by ligatures applied to the blood-vessels alone, and the raw surface covered by drawing the adjacent peritoneum over it with a running catgut suture. When the pedicle is long, by tying in small sections close to the tumor tension is avoided and bleeding more safely controlled.

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### *CARCINOMA OF THE PENIS.*

HOOTON (*Indian Medical Gazette*, vol. xxxv, No. 12, 1900) makes the following remarks upon this subject:

In view of the special characters of carcinoma of the penis, it seems that total removal of the organ is the best treatment as a rule. The disease spreads rapidly in the cavernous tissue, and breaks down early, while, on the other hand, the glands do not appear to be often involved, and the patient's chance of recovery after a radical operation is good. It is noteworthy that the author has seen no case in which the disease had not made considerable advance, and in some cases it would have been difficult to obtain a sufficient stump for the ordinary flap operation. As regards the operation, there are one or two points which may perhaps be mentioned; as Captain J. B. Smith, who performed successfully this operation on a patient of middle age, has pointed out, it is an advantage to remove the growth as a preliminary, after transfixing the penis with a needle and applying an elastic ligature above it. This ligature does not interfere with the passage of a staff, and the urethra is more readily found. The operation area can then be cleaned with a better prospect of success than when in proximity to the ulcerating mass.

The median incision should extend to a point about two inches from the anterior margin of the anus, and thus lies over only about one inch of the triangular ligament. While separating the halves of the scrotum some dilated veins are often divided, but the only difficulty in arresting hemorrhage is met with when the arteries of the corpora cavernosa and the dorsal arteries are cut. These, as they emerge from the triangular ligament, are sometimes awkward to secure.

### *A CASE OF ADDISON'S DISEASE SUCCESSFULLY TREATED BY TABLETS OF THE SUPRARENAL CAPSULE.*

EDEL (*Münchener Medicinische Wochenschrift*, No. 52, 1900) reports a typical case of Addison's disease treated with markedly beneficial effect by tablets of the suprarenal capsule. The improvement, which was noted by a number of observers, continued for a month and a half, when unfortunately the patient perished of tuberculous meningitis.

The man was thirty-three years old, and began to suffer in January, 1900, from a sensation of pressure located between the shoulder-blades. Following this he became weak and unfitted for his work. In April his skin was markedly bronzed. Two large lymphatic glands were noted in the supraclavicular fossa. The disease was steadily progressive.

Two or three days after beginning the tablets there was a distinct improvement of both subjective and objective symptoms. The patient was able to resume his occupation, and the brownish discoloration steadily grew less. At the time meningitis developed, the discoloration of the skin had almost completely disappeared. With the onset of inflammatory symptoms the suprarenal tablets were discontinued; the bronzing promptly returned, though the patient lived but seven days.

The autopsy showed a tubercular meningitis, extensive tuberculosis of the lymphatic glands, and a partial encapsulation of the solar plexus and semilunar ganglion in scar tissue. In the right suprarenal capsule there was a small tuberculous nodule.

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### *THE TREATMENT OF GANGRENOUS HERNIA BY PRIMARY RESECTION.*

HOFMEISTER (*Beiträge zur Klinischen Chirurgie*, Bd. xxviii, Heft 3, 1900) operates upon gangrenous hernia under local anesthesia, employing the infiltration method, and reenforcing this with moderate doses of morphine. After opening and thoroughly disinfecting the hernial sac, the aperture through which the gut has escaped is enlarged, an assistant guarding against the sudden slipping back of the necrotic intestine when tension has thus been relieved. The gangrenous portion of the gut is then resected, and a lateral anastomosis is accomplished, the intestinal ends being closed. Out of sixty-four herniotomies with a general

mortality of 21.9, there were twenty-five gangrenous cases; of these, forty per cent died.

From a statistical study it would seem that gangrenous hernia treated by the formation of an artificial anus is attended by eighty per cent mortality, whilst that treated by primary resection is attended by 23.5 per cent mortality. As this operation saves most lives, Hofmeister has no hesitation in asserting that primary resection is the one of choice.

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*EMPYEMA TREATED BY REPLACING THE EXUDATE BY A NEUTRAL FLUID.*

H. P. RITCHIE (*St. Paul Medical Journal*, vol. iii, No. 1, 1900), deterred from resecting a rib by the depressing effect of this operation in tubercular pleurisies in young and weak children, tried Lerascheff's method of replacing a purulent exudate with a neutral fluid. The child was in such condition that an operation was unjustifiable. He aspirated four times the first day, and each time injected normal salt solution, warmed. The last time only a turbid fluid returned. Under medical treatment of guaiacol and cod-liver oil, and without further surgical procedure, the child rapidly recovered.

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*FOREIGN BODY IN BRONCHUS TREATED BY INTRATRACHEAL INJECTIONS.*

H. TAYLOR (*St. Paul Medical Journal*, vol. iii, No. 1, 1900) gives the following record in regard to a little girl ten years of age, who had been sent to him by her physician to have her tonsils removed and her throat treated because of an obstinate cough.

The family history was tubercular. The patient had never had a severe illness, and had always recovered promptly from the mild attacks of infantile disorders which she had had. She was a confirmed mouth-breather. Present illness dated from the past summer, and the mother thought from a visit to a dentist during the month of August. In pulling a tooth the dentist's forceps had slipped. The child had had a violent choking and coughing attack, which subsided in a short time, but the tooth was never found. Since that time the child had had frequent paroxysms of violent coughing. At first the expectoration was stained with blood. Of late there had been no blood, but the expectorated matter had a very offensive odor; the child was feverish every day, had become extremely emaciated, and her sleep was disturbed by paroxysms of coughing and by night sweats. Inspection showed a poorly nourished child, with pinched features, dull and listless expression.

Temperature was 103°, pulse very rapid. Left tonsil and adenoids were found enlarged, but there was no acute inflammation to account for the fever. On physical examination of the thorax, a small area was found beneath the angle of the scapula where vesicular respiration was absent, except on very deep inspiration, when it was weak and distant and partook of a bronchovesicular character. No dulness could be found. Examination with the Roentgen rays showed an indistinct cloudiness at the base of the left lung that was distant from the heart shadow. The diagnosis was that the tooth was in a bronchus in the lower lobe of the left lung, and was the cause of the child's very serious condition. An abscess was probably forming, and the prognosis was extremely grave.

The only treatment was intratracheal injections of oil containing menthol and guaiacol, with a tonic and a sedative for the night. After several intratracheal injections, which had reduced the number and severity of the paroxysms, and diminished the intensity of the odor, the child coughed long and violently and expelled the tooth, which was embedded in a mass of pus and mucus. It was an irregularly cone-shaped milk-tooth (canine), slightly over a centimeter in length and half a centimeter in its greatest transverse diameter.

The patient made a rapid and uninterrupted recovery, except that when the tonsil was taken out some weeks later she had a number of free hemorrhages, which recurred at short intervals for eight hours, when she lost a great deal of blood. When last seen she was the picture of health and had not a single symptom that anything had ever been wrong in her lung.

The points of interest in this case are that several physicians had examined the child, but none of them thought that the tooth was in her lung, although the history of a lost tooth, a laryngeal spasm, with blood-stained expectoration for several days, is a train of very suggestive events and symptoms.

In regard to the treatment, the question of interest is, had the tracheal injections anything to do with the expulsion of the tooth? It seems probable that the oil may have softened the accumulation of pus and mucus which surrounded the tooth, and also that

the menthol and guaiacol may have reduced the swelling and congestion of the mucous membrane, thus allowing of the easier expulsion of the foreign body.

In conclusion it would seem proper to urge the use of intratracheal injections when the presence of a small foreign body in the lung is suspected. Larger bodies must be removed mechanically, either with long forceps or coin catchers through a low tracheotomy wound, or after the formation of an abscess, through an opening in the chest wall; but smaller bodies, which do not so readily become hopelessly impacted, are often coughed up, and the injections of oil can but hasten and assist the process.

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*SUTURE AND WOUNDS OF THE HEART.*

WUALCKER (*Revue de Chirurgie*, December, 1900) has in the last twenty years seen five cases of stab wounds of the heart which recovered. Two cases in the last year were treated by suture. Both perished. Two others treated without suture recovered.

The first case treated by suture was twenty-seven years old and had attempted suicide by means of a knife, the blade of which was two and a half inches long. Over the heart there were twenty stab wounds, and in the fourth intercostal space there was an area the size of a dollar in which there were so many stabs that the individual wounds could not be distinguished one from the other. Air was escaping with each expiration, making a blowing sound, and there was free bleeding. On the left side of the chest breathing could be heard only at the apex.

On enlarging the opening in the chest the heart could be seen pressed backward and to the left. One intercostal artery was tied, the pleural cavity was emptied of blood as far as possible, and the opening was tamponed. None the less bleeding persisted so that the fourth rib was resected and the third rib cut through. The borders of this wound were then strongly retracted, the pericardium was seized in forceps, was drawn forward and opened, and the apex of the heart was pressed up into the wound by means of the fingers passed behind it. Eight stabs were noted on the anterior surface of the left ventricle; these were bleeding moderately. A probe passed in showed that the wounds had penetrated into the ventricle; the coronary arteries were not injured. The stabs were sewed by silk sutures passing completely through the heart wall. In all eleven sutures were inserted. The pericardium was then secured to the external wound, and its cavity was drained by iodoform gauze strips. This entirely stopped the bleeding from the heart and the pericardium. The left pleural cavity was then tamponed and the wounds closed. The bleeding, however, persisted. The small lobule of lung adhering to the pericardium was then ligated and removed. The patient died, however, thirteen hours after the injury. Upon autopsy there was complete atelectasis of the lung and numerous thrombi on the inner ventricular surface indicating the position of the wounds.

Another patient, fifty-three years old, was stabbed just below the costal border. On abdominal section it was noted that blood came from an opening in the diaphragm, which on being explored by the finger showed that there was a wound of the heart. The ribs were resected from the fourth to the seventh over the heart region, opening the left pleural cavity, which was at once closed with gauze tampons. The pericardium was then seized and drawn out; the point of the heart was pushed forward by a finger introduced through the diaphragm opening. Through the wound in the heart there was a stream of black blood spurting with each systole. The first stitch which was inserted cut through at once, as did the second. The stitches could only be made to hold by including in them the pericardium and gauze pledgets. It was with great difficulty that the hemorrhage was stopped. The patient died three-quarters of an hour after operation.

The third patient attempted suicide by inserting a knife in the third intercostal space a little external to the sternal border. There were no immediate signs of a perforating wound, but on the second day the patient complained of severe pain, and the dressing was found soaked with blood. On removal of the bandage there was a little bleeding from the wound with each respiration, and a dulness over the lung posteriorly reaching as high as the level of the scapula above this, and in front there was a tympanitic sound. A probe passed downward and forward through the fourth intercostal space into the pleural cavity. Incision showed a wound an inch long in the pleura of this space through which the blood was escaping. The incision was then carried through the pleura of this space from a fingerbreadth external to the sternum to the axilla. By forcibly drawing the fourth and fifth ribs apart, the pleural cavity could be very well seen, and the hand could be intro-

duced for the purpose of exploring the entire lung and bringing it within view. No lung wound was found, but the bleeding was seen to come from a wound in the pericardium, the blood flowing out with each diastole. Corresponding with the pericardium wound there was a depression of the heart muscle, apparently of the ventricle. The clots were cleared from the pleural cavity and the intercostal wound was packed with gauze. Suppuration followed, and required drainage. The patient, however, recovered.

Another patient stuck a needle in her heart. She recovered without incident.

Another patient stabbed himself with a table knife in the fourth intercostal space about an inch within the mammillary line. The external wound was cleansed and drained, and he died. At the autopsy a perforating wound two-fifths of an inch long was found in the left ventricle, but there was a large amount of blood in the pericardium and the left pleura, together with left-sided pneumothorax.

The author believes that the best way of exploring the heart for suture is to resect the cartilage of one rib and cut through as many others as needful, employing thereafter powerful retractors for the purpose of rendering the wound patulous.

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### *NON-CANCEROUS TUMOR OF THE STOMACH.*

VON HACHER (*Centralbl. f. Chir.; Edinburgh Medical Journal*, January, 1901) draws attention to the fact that tumors originating in the connective tissue or muscular coats of the stomach present clinical features which are quite different from those of cancer. The tumors attain a much greater size, and it is often difficult to recognize whether they originate in the stomach, or in the omentum, mesentery, liver, kidney, or spleen. Stomach symptoms are either absent altogether, or they are such as might be caused by any tumor pressing on the stomach; in exceptional cases, when they involve the pyloric segment, they may cause stenosis and characteristic vomiting. The tumors met with include myoma, fibromyoma, sarcoma, fibrosarcoma, and myxoma. In those which project into the general peritoneal cavity the treatment varies with the nature of the tumor; in malignant forms, a portion of the stomach wall must be removed along with the tumor. Von Hacher demonstrated a female patient, aged twenty-six, in which he had removed a tumor (myxoma), as large as a man's fist, growing from the anterior wall; he resected the portion of stomach involved by the growth; the patient was perfectly well twenty-two months later, and had recently married.

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### *THE CAUSATION, PREVENTION, AND TREATMENT OF POSTPARTUM HEMORRHAGE.*

G. F. BLACKER (*The Lancet*, No. 4035, 1900) discusses the above subject as one of great interest to medical practitioners.

The appalling suddenness of the accident and the great risk to life entailed upon the patient render it a matter for congratulation that cases of postpartum hemorrhage are not met with more frequently, and that its occurrence can usually be avoided by proper prophylactic treatment.

In the University College Hospital maternity department during the period from August 1, 1893, to December 1, 1900, 15,130 women have been delivered. Of this number 139, or one in 108, have suffered from some degree of postpartum hemorrhage. In 100 of these cases, or one in 151, the amount of blood lost was not very excessive and did not cause any marked symptoms; while in eight instances, or one in 1881, the patient's life was endangered, two of these cases ending fatally—a mortality of one death in 7565 deliveries. Amongst 20,378 confinements in the Charité Hospital in Berlin only two deaths occurred from postpartum hemorrhage—a mortality of one in 10,189. Veit, who has collected a large number of statistics in addition to these, found amongst 47,065 labors only five deaths from atonic postpartum hemorrhage—a proportion of one in 9413 confinements. Although the death-rate from postpartum hemorrhage is therefore relatively small, yet the total number of fatal cases must be considerable. Dührssen states that 300 women die annually in Prussia from this cause, while the frequency of cases causing severe symptoms—viz., one in every 488 confinements in the University College Hospital maternity department—renders this accident of labor one of much importance.

Blacker proceeds to discuss postpartum hemorrhage under the three headings of causation, prevention, and treatment, and confines his remarks to the variety due to atony of the uterus.

Before passing on to consider its causation he calls attention to a few facts concerning the mechanism of the third stage of labor. The anatomical studies of Barbour, Pinard,

and Varnier have demonstrated that at the end of the second stage of labor the placenta is still completely attached to the uterine wall. Separation of the placenta begins with the third stage of labor, and is due to the contraction and retraction of the uterine muscle. It is this latter property of active retraction—or what may be termed the tonicity—of the muscle which prevents the occurrence of hemorrhage when the uteroplacental vessels are torn through during the separation of the placenta. The absence of inhibition of this power of retraction is the chief cause of postpartum hemorrhage, giving rise as it does to atony of the uterus, or inertia uteri. It is because the retraction of the uterine muscle is prevented by the presence of the fetus *in utero* that premature separation of the placenta is so often accompanied by severe hemorrhage.

The causes of postpartum hemorrhage are, therefore, to be sought in the conditions giving rise to uterine inertia. These may for convenience be classified as follows:

1. Feebleness, exhaustion, or malnutrition of the patient.

2. Overdistention of the uterus and undue stretching of the uterine muscle, such as occurs in cases of hydramnios or multiple pregnancies.

3. Exhaustion of the uterine muscle from frequent child-bearing and prolonged labor. One of the commonest causes of postpartum hemorrhage is the application of forceps and the delivery of the child when pains are absent and the uterus is exhausted and in a condition of secondary uterine inertia—the so-called "temporary passiveness" of Braxton Hicks.

4. Pathological conditions of the uterine wall. The presence of fibroid tumors is especially liable to cause postpartum bleeding if the placenta be attached over the site of the tumor.

5. Some mechanical hindrance to the contraction and retraction of the uterus, such as the retention of the placenta *in utero* or the presence of adhesions between the uterus and surrounding structures.

6. Too rapid emptying of the uterus, either by the application of forceps or after version.

7. Extreme nervous depression and shock such as may follow the birth of a dead child may account for uterine atony in some cases.

8. The administration of chloroform has often been regarded as a cause of uterine inertia.

9. Another possible cause of excessive bleeding after delivery is deficient coagulability of the blood. Such a condition occurs in cases of septic infection and hemophilia.

In discussing the preventive treatment of postpartum hemorrhage it is necessary to consider the treatment of the patient during pregnancy and during labor. It is important that all patients should enter upon labor in as favorable a condition of health as possible. Attention must therefore be paid to the general health in all cases where this may be necessary. If the patient has lost excessively at her previous confinements small doses of ergot and strychnine combined with iron or hydrochloric acid may be given during the last month or so of pregnancy, as recommended by Dr. Lombe Atthil. Women with a history of hemophilia should be given calcium chloride in ten-grain doses three or four times a day for the last two or three weeks preceding delivery. Although, as we have seen, it is very doubtful whether albuminuria *per se* is a cause of postpartum flooding, yet for obvious reasons it must be treated, and the patient should be placed upon a strict milk diet. The great value and importance of preventive treatment is well exemplified by Spiegelberg's statement. He writes: "I certainly do not exaggerate when I say that severe postpartum hemorrhage is almost without exception the fault of the attendant."

In no less than 50 of the 319 cases occurring in the University College Hospital maternity department the child was born before any assistance arrived. In six out of the eight severe cases this happened, including the two cases in which the women died.

The prevention of postpartum hemorrhage is of even greater importance than its treatment, and it may with truth be said that the skill of an accoucheur can be estimated by the number of such cases that occur in his practice. During labor, it is often good treatment to rupture the membranes, even before the cervix is fully dilated, in cases where we fear the occurrence of hemorrhage after delivery. During the second stage of labor care must be taken not to allow the uterus to become exhausted, and to recognize as early as possible conditions likely to cause obstructed labor. When the uterus is in a condition of secondary inertia, the mistake of delivering by forceps must be avoided and the case treated by opium and rest, while in cases of obstructed labor the necessary measures must be at once adopted to overcome the obstruction.

When toward the end of the second stage the pains are feeble and no progress is being made, ergot in doses of from half a drachm to one drachm of the liquor ergotæ ammoniatus may be given, if it is perfectly certain that the labor is an absolutely normal one. The practice of giving ergot before the birth of the child is undoubtedly in certain cases a very valuable one, and is regarded at the present time with more disfavor than it deserves. This method is especially applicable in cases where deep anesthesia is necessary in order to complete delivery.

It is, however, in the proper management of the third stage of labor that the secret of preventing postpartum hemorrhage lies. Too often it occurs as a sequel of hasty and premature attempts to express the placenta, with the result that a portion of the placenta or membranes is left *in utero*. A sufficient amount of time must be allowed to elapse to permit of proper separation of the placenta, and under ordinary circumstances no attempt should be made to express it until twenty or thirty minutes after the completion of the second stage of labor. From the time the child is born until the placenta is expelled one hand should be kept continuously upon the uterus. The dorsal position has many advantages during the third stage of labor, but in cases where bleeding occurs the necessary manipulations are most readily carried out with the patient on her side.

At the end of the second stage the fundus of the contracted uterus is usually at the level of the umbilicus. Toward the end of the third stage it will be found to have ascended until it lies from one and a half to two inches above the umbilicus. This indicates that the placenta has been separated and expelled from the upper uterine segment into the lower uterine segment, and that it is in a condition in which it can be easily expressed.

It is more particularly in cases where it is necessary to revive an asphyxiated child, or where the medical attendant's attention is directed away from the mother, that severe postpartum hemorrhage is likely to occur. It is impossible for a uterus to relax completely unperceived if it be watched with the hand during the whole of the third stage of labor. In any case where hemorrhage has occurred, or where the uterus shows a tendency to again relax, it must be carefully supervised until it is certain that contraction and retraction are complete and permanent.

When postpartum hemorrhage does occur the medical man must have a plan of treatment ready and be able to carry it out rapidly and efficiently. The practitioner does not do justice to his patient nor to himself unless he has ready at hand the few appliances necessary to enable him to deal with such a complication should it arise.

The best method of treating a case of severe hemorrhage will depend upon whether the placenta is still *in utero* or not. The ordinary treatment may be outlined as follows: If the placenta be retained, it must be at once expressed, or if this is found impossible, removed by the hand. A hypodermic injection of ergotin if ready may be given, and the uterus kneaded through the abdominal wall, while the nurse is ordered to prepare a hot douche. If the hemorrhage be profuse and the uterus does not respond to the kneading, bimanual compression may be carried out until the douche is ready. In the small number of cases where the hot douche fails to excite any uterine contractions and the tone of the muscle is entirely lost, recourse must be had to continued bimanual compression, to plugging the uterus with gauze, or to the application of some styptic, such as perchloride of iron, to produce clotting of the blood in the vessels.

We may now consider these various methods of treatment rather more in detail.

It is impossible for the uterus to contract and retract while the placenta is still *in utero*, and therefore its removal must be undertaken before any attempts are made to excite uterine contractions. Whenever possible this should be effected without the introduction of the hand into the uterus. No time, however, must be lost if expression fails, and when necessary the hand must be passed into the uterus and the placenta and all blood-clot removed. The introduction of the hand has the advantage that it is a powerful excitant of uterine action. Ergot takes too long a time to act to be of much value in the treatment of a case of severe bleeding. In all cases where it is ready a hypodermic injection of ergotin may be given so that the assistance of its action may be obtained in rendering permanent the uterine contraction and retraction procured by other more speedy methods of treatment. In the less severe cases kneading the uterus is often all that is required to excite contractions and to arrest the bleeding. In the more severe cases this is not sufficient, and in these a hot douche must be given.

There are several important details to be

observed in employing this form of treatment. The water must be used in large quantities and at a temperature of not less than from 110° to 120° F. The uterine tube should be carried into the uterus up to the fundus, and the whole of the inner surface of the organ irrigated by the fluid. This is rendered more easy, and at the same time the hemorrhage may to some extent be checked, if the uterus be drawn down to the vulva with a vulsellum. This method of drawing down the uterus is at times alone sufficient to arrest the bleeding, no doubt by the kinking and compression of the uterine arteries which it causes. Some antiseptic may be used in the water, such as creolin or iodine, but plain hot water will do perfectly well in an urgent case.

Bimanual compression of the uterus is the best method to employ when the hot douche is not immediately available, or where it fails to excite uterine contractions. The uterus seized by the hand on the abdomen is compressed against the anterior abdominal wall, the posterior surface of the symphysis pubis, and the other hand placed in the anterior vaginal fornix. The pressure should be exerted as far as possible upon the placental site; no great force is required, and it can be continued for a considerable length of time, although at the cost of a great deal of fatigue on the part of the attendant. The chief objection to this method is the difficulty sometimes experienced in grasping the completely relaxed uterus between the two hands. Whether the fist or the extended hand be introduced into the vagina is a matter of indifference so long as the anterior and posterior walls of the uterus are kept firmly in contact. All the 139 cases of hemorrhage occurring in the University College Hospital maternity department were treated by the hot douche or bimanual compression. In no case near full term was the uterus plugged with gauze or injected with styptics.

As a routine means of treatment plugging the uterus is certainly inferior to bimanual compression. There are, however, two classes of cases in which the latter method is specially indicated — viz., where the uterus is prevented from contracting and retracting by the presence of adhesions or by the existence of fibroid tumors in its wall. Schauta has suggested that in some severe cases of hemorrhage the uterine vessels are atheromatous, and in any instance where this condition is suspected gauze plugging would no doubt be the best treatment. Schmit has recorded a case of this kind in which the patient died from uncontrollable hemorrhage, although the uterus after plugging had failed was ultimately removed in an endeavor to arrest the bleeding. On microscopic examination well marked hyaline degeneration of the vessels at the placental site was found. Plugging the uterus may be carried out in the following way: The uterus is drawn down to the vulva with a vulsellum—a maneuver which has the advantage of assisting to arrest the hemorrhage—or is pushed down by pressure through the abdomen. The left hand is introduced up to the fundus and all blood-clot removed. The strips of gauze or of any other available material wrung out of an antiseptic lotion are passed into the uterus under cover of the fingers of the left hand by means of a pair of uterine dressing forceps or the intra-uterine douche tube, and the cavity firmly and completely packed from above down. Special care must be taken that no space in which blood could accumulate is left between the fundus and the gauze. In bad cases the vagina should also be plugged. A large pad of wool may then be placed over the vulva and a binder and T-bandage applied with considerable pressure. The plug is taken out at the end of from eighteen to twenty-four hours. If hemorrhage continues the plug must be removed, the uterus washed out, and then replugged.

Since 1893 there has not been any case of postpartum hemorrhage alone in the maternity department of the University College Hospital in which plugging the uterus has been required. This method has, however, been frequently employed for hemorrhage after abortions and other conditions, and is of great value in the treatment of some cases of rupture of the uterus.

The last mode of treatment the author mentions is the application of powerful styptics to the interior of the uterus, a method which at the present day is almost superseded by gauze plugging. The drug most commonly used is the liquor ferri perchloridi fortior of the strength of one part to three parts of water. It may be injected into the uterus by means of a tube, or the interior of the organ may be washed out with a sponge or wool dipped in the solution. It is undoubtedly a most efficient means of producing thrombosis, but its dangers outweigh its advantages. It is extremely likely to produce sloughing, septic thrombosis, and general septic infection. Turpentine and vinegar may also be employed in the same way.

In cases where the hemorrhage has been successfully arrested but where the loss has been excessive, the condition of the patient is usually very grave, and energetic after-treatment is required if her life is to be saved. The greatest reliance is to be placed in the treatment of such cases on the hypodermic injection of strychnine, ether, and digitalin. Ether may be injected in doses of ten minims every ten or fifteen minutes until five or six doses have been given. Where cardiac failure is very marked, hot water or normal saline solution should be injected. The former may be given by the rectum; the latter may be injected under the skin or into a vein. In severe hemorrhage the most valuable of these methods is venous transfusion. Infusion of hot water or saline fluid has been carried out in ten of the reported cases—five times by the rectum, four times into a vein, and once into the submammary connective tissue. The amount of fluid employed varied from one to five and a half pints. One patient was transfused twice, three pints being introduced into one arm and two and a half pints into the other.

Rectal injections of hot water with or without brandy are of great value in cases where the circulation is not too feeble. They act as a powerful stimulant, and in such cases the fluid is no doubt absorbed. In many cases of severe hemorrhage accompanied by a very feeble action of the heart, it is quite certain that no absorption occurs either from the stomach or bowel. In such cases venous transfusion must be carried out, and gives exceedingly good results. The author's experience of subcutaneous transfusion in cases of septic infection and other conditions leads him to regard it as too slow a method to use in cases of hemorrhage. Common salt can be obtained in any household, but it is best to carry it as a chemically pure sodium chloride or as a concentrated solution in a sealed glass tube. The solution employed should contain one drachm of salt to the pint, and must have a temperature of from 101° to 102° F. It will cool down to blood heat while passing through the transfusion apparatus. Care should be taken to see that the temperature is maintained during the operation, and this can most easily be done if the solution be prepared in small quantities at a time. It should in all cases be filtered through muslin before use. If it be necessary to repeat the transfusion another vein must be opened. When the patient has been revived and the immediate danger of death from syncope is staved off, the extreme restlessness and headache that so frequently follow may be treated by large doses of opium or morphine. Any further tendency to syncope is best treated by raising the foot of the bed and the administration of liquid food and stimulants in small quantities at frequent intervals. The great risk of subsequent sepsis must not be forgotten, and the convalescence of such patients is of necessity a slow process.

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### *INFECTIVE PAROTITIS AFTER ABDOMINAL SECTION.*

ELDER (*Lancet*, Jan. 19, 1901) compares a case of double parotitis after abdominal section from which apparently two other cases of parotitis originated, reported by Addenbrooke, with a case developing under his care.

Forty-nine days before the onset of the first symptoms the patient's brother in the same house was attended for mumps (double parotitis), but the source of infection in this case could not be traced. The two brothers had been living in the same house from that date until the onset of the appendicitis, but they had occupied the same room two days before the appendicitis commenced, and nine days before the first parotid became inflamed.

Elder thinks that one can hardly exclude infection from the first case, despite the lapse of seven weeks, as a cause of the second case.

Considered with the cases reported by Addenbrooke, it is found that the opposite condition from Addenbrooke's cases obtained, viz., there was a case of infective parotitis in the same house seven weeks before the onset of double parotitis following an abdominal wound, while in Addenbrooke's cases a double parotitis followed an abdominal section, and after coming in contact with the patient inflammation was set up in the second patient's parotids. This second person apparently infected a third person.

Elder doubts whether his second case was one of true mumps or parotitis following an abdominal wound, and whether Addenbrooke's first case was one of parotitis caused by the abdominal wound or a case of true mumps due to infection the source of which he was unable to trace.

*ENLARGEMENT OF THE PROSTATE.*

FREYER (*Lancet*, Jan. 19, 1901) believes that in certain cases of enlarged prostate an operation is desirable, but that in the majority of cases the only treatment is cleanly and judicious catheterism, combined with careful hygienic living. He uses a large steel dilator as far as the bladder once a week, and leaves it in position for ten or twelve minutes, commencing with a No. 11 or No. 12, English scale, gradually advancing to No. 15 or No. 16, in cases where decided symptoms of obstruction exist, and the bladder contains no "residual" urine, or only an ounce or two. This probably does not stay the progress of the disease, but the periodical introduction of the dilator causes absorption of the gland around the urethra and maintains the patency of the channel, thus staving off for an indefinite period the necessity of recourse to habitual catheterism. A liquid extract of ergot combined with a saline seems to relieve congestion in these cases.

Habitual catheterism must be employed when the residual urine amounts to between three and four ounces. The catheter should be passed once in twenty-four hours if the urine amounts to four ounces or less; the best time being at bedtime. It should be used twice daily if six ounces is retained; three or four times daily if eight or ten ounces is retained. The catheter, when power of voluntary micturition is lost, should be used generally every four hours. In all cases the urine should be drawn off before pain or marked discomfort is felt; otherwise congestion of the prostate and bladder resulting in cystitis will be produced.

The patient should be taught the use of the catheter. The best instrument for habitual employment is a soft coudée, No. 7 to 9 E. It should be used by the patient while standing, unless he is very infirm. It is held perpendicularly while its end is introduced into the urethra, is then gradually depressed into the horizontal position as it glides along the canal over the obstruction and into the bladder, the curved end being directed upward toward the roof of the urethra. When the middle lobe is much enlarged a bicoudée catheter or a well curved one terminating in an elbow may be necessary to overcome the obstruction.

When circumstances require the use of a metel catheter, the surgeon and not the patient should employ it.

Whatever instrument is employed should be kept scrupulously clean. Of the three kinds employed, the metallic and the soft rubber may be easily and effectually sterilized by boiling. Gum-elastic instruments are best cleansed by washing and syringing them through with soap and warm water. They should then be placed in a 1-in-40 solution of carbolic acid for ten minutes [the editor has found that such a soaking in carbolic lotion invariably ruins woven catheters], and placed in boric lotion before use; prolonged application of antiseptics renders them useless.

Before introducing an instrument into the bladder, the foreskin and glans should be well washed with soap and water, and then swabbed with some weak antiseptic lotion. If there be any discharge from the urethra, the anterior part of the canal should be syringed out with warm boric solution.

The catheter, after use, should be washed in soap and water by the patient, thoroughly dried, and placed for future use in a corked glass tube or covered dish. The best way to dry the instruments is to pass them between folds of lint or gauze, in which they may be kept until required.

If the catheters be placed quite dry on trays in an air-tight box with trioxymethylene enclosed between folds of lint, they are rendered quite aseptic in twenty-four hours by the vapor given off, which is really formol in a gaseous form. Before use they should be placed in a boric lotion, as the formol is slightly irritant to the mucous membrane of the urethra.

As lubricant for the instruments, fresh olive oil, or castor oil, or vaselin, may be used. Carbolic acid should not be employed. Guyon's pomade, composed of equal parts of glycerin, powdered soap, and water, with one per cent of phenol or naphthol, is a clean and efficient lubricant.

The diet of the patient should be light, simple, and nutritious, but nothing should be taken that would irritate the urinary tract. The less stimulants the better. Warm clothing should be worn, and cold or wet seats should be avoided. A warm bath is helpful, and is best taken at bedtime. The bowels should be kept open, and there is nothing better for inducing a soft, but not liquid, motion daily than confection of sulphur or senna or equal parts of both. Aloin, licorice powder, and the sulphate of soda are useful, or one of the natural bitter saline waters may be taken in the morning. The enema should be at hand if the other medicines fail to induce a daily motion. If pain be present, an

opiate must be given by the mouth, hypodermically, or as a suppository. Belladonna should not be administered while the bladder retains any expulsive power. Walking or carriage riding is the best exercise. The patient should pursue as far as possible his avocation. Sexual excitement should be avoided.

Many men pass useful and enjoyable lives for fifteen or twenty years after entering on the habitual use of the catheter.

When in elderly men there is difficulty and frequency of micturition with some pain, the urine being turbid, possibly fetid, the patient looking ill and worn-out, and the hypogastric dulness pointing to the presence of a considerable quantity of residual urine, the case must be regarded as one of considerable gravity. The employment of the catheter for the first time in these cases may be attended by severe constitutional disturbances. The examination should be made in a warm room, and the patient should be put to bed; and if constitutional disturbances set in, he should remain there longer than two or three days. The urine should be drawn off gradually, the bladder not being completely emptied for two or three days.

In an advanced state of prostatic disease of this kind, the urine, even when clear and acid on the first introduction of the catheter, generally becomes clouded and finally ammoniacal in the course of a few days, and constitutional symptoms supervene. A rigor will probably occur, or the temperature may rise to 103° or 104° F., profuse perspiration setting in. The normal temperature being reached, the fever may not recur. Sometimes more than one attack of this kind occurs, or the fever may continue for some days, gradually subsiding; but occasionally the patient sinks into a low typhoid state. If the kidneys are much affected, uremia may set in, followed by coma, and may result in a fatal termination. This fever is termed "urinary," "urethral," and "catheter," but its exact cause is unknown. Its treatment is similar to that following instrumentation or operation for stricture of the urethra. When the urine contains pus the local treatment should be the same as that to be described for cystitis.

Cystitis, a common complication of enlarged prostate, should be dealt with in its earliest stage. When the urine becomes cloudy, boric acid may be given in 10-grain doses four times daily. A medical patient has found that 25-grain doses have been more effectual in bringing the urine back to its normal condition than repeated small doses. If the urine becomes decidedly alkaline, the boric acid should be combined with the benzoate of ammonia in 10-grain doses.

When pus forms the bladder must be washed out once or twice daily with disinfectants or astringent lotions. Not more than two or three ounces should be thrown into the bladder at one time. If the cystitis be severe, not more than half an ounce should be used at a time. All lotion should be warmed to 100° F. To cleanse the bladder the most simple and useful injections are a one-per-cent solution of boric acid or a teaspoonful of boroglycerin to four ounces of water. Permanganate of potash solution commencing with 1-in-5000 and gradually increasing it to 1-in-1000, and perchloride of mercury 1-in-10,000, make excellent injections. The sheet-anchor in such cases is nitrate of silver, commencing with a weak solution, 1-in-4000, gradually increasing this to 1-in-750.

For great pain and scalding at the neck of the bladder from local cystitis daily instillations of nitrate of silver are employed.

In complete retention of urine, a vulcanized rubber catheter should be used. If this fails a coudée catheter and a well curved one terminating in an elbow should be tried in succession. If these are unsuccessful, a well curved cylindrical gum-catheter without a stylet should be employed, which may be given any curve at pleasure by dipping it in hot water, and, after bending, into cold water. Finally it may be necessary to employ a silver catheter with a longer curve.

In cases of enlarged prostate of long standing, it may be found that before the bladder is fairly entered a preprostatic pouch is encountered.

Hemorrhage rarely occurs in the early stage of enlargement of the prostate, but is liable to take place in the later stages from various causes. Bleeding may arise from the mucous membrane of the bladder or from the prostate. The treatment consists in perfect rest in bed and the administration of opium. Frequent hemorrhage attended by much pain after exercise in prostatic patients should always give rise to the suspicion of the presence of stone.

The procedures in the operative treatment of enlarged prostate may be classified as follows: (1) Radical operations which aim at removing the obstructing portions of the glands; (2) those undertaken for the purpose of inducing atrophy of the prostate—castration, and excision of the vasa deferen-

tia; (3) palliative operations — drainage of the bladder through the perineum, and drainage of the bladder above the pubes.

The division of the prostatic obstruction by galvanocautery has few advocates.

Another operation with a very limited range of application is the removal of a median growth through a perineal opening in the urethra by means of forceps or instruments constructed to punch out a portion of the growth.

Probably the most valuable of the radical procedures for the removal of prostatic growths is suprapubic prostatectomy. The preliminary stage of this operation, cystotomy, is identical with that for the removal of vesical stone or tumor by the suprapubic method. As soon as the bladder is opened, the forefinger of the left hand is introduced and a general survey of the cavity is made. If the middle lobe be pedunculated, it can be removed by clipping the pedicle through, flush with the trigone, by scissors curved on the flat, or by twisting it off with the aid of the forceps. A sessile middle lobe is removed by notching the mucous membrane and submucous tissues on either side of the growth, which is then twisted off by forceps. A prostatic bar or lower portion of hypertrophied collar is similarly removed or cut away by means of Jessop's forceps. A prominent lateral lobe is first grasped by strong catch forceps to render it steady. The mucous membrane at the most projecting part is then snipped by scissors. The opening thus made is then enlarged by the finger-nail and the tip of the finger is introduced. The tumor is enucleated by slowly and carefully separating it from the surrounding tissues. The enucleation, after the snipping of the mucous membrane by the scissors, should be accomplished with the finger-point. Bleeding may be controlled by irrigation with hot boric lotion. If at all profuse the thermocautery should be applied to the bleeding points through a speculum, or the tincture of the perchloride of iron on a sponge. The finger of an assistant placed in the rectum may be of great aid. Sometimes the enucleation may be best effected by the surgeon introducing one or two fingers of the right hand into the rectum while the finger of the left hand is in the bladder. The drainage of the bladder and after-treatment are the same as after suprapubic cystotomy for stone or tumor.

Perineal prostatectomy by Dittel's method does not appear to be encouraging. Nicoll has modified this operation by performing a preliminary suprapubic cystotomy, for the purpose of introducing the finger into the bladder to push the prostatic tumor into the perineal wound, thus facilitating its removal. At the same time there is obviated the opening of the mucous membrane of the bladder or urethra.

A new method was employed by Freyer in 1899. He took advantage of Dittel's incision, but Nicoll's objects were attained by a much less serious proceeding than suprapubic cystotomy. The bladder was explored by a perineal urethrotomy, and it was decided to remove perineally the tumor which he discovered in the case reported. A crescentic incision about four inches long was made from the median raphe at the lower end of the urethral wound backward around the anus to the coccyx on the right side. The dissection was carried deep into the ischiorectal fossa, the rectum being drawn inward by a broad retractor. The left forefinger was passed through the urethral wound into the bladder and hooked round the tumor, which was pressed out into the wound and thus came well into view. The capsule of the prostate was incised and peeled off by means of an elevator. The tumor, which involved the whole of the right lobe of the prostate, was thus removed piecemeal by cutting forceps and curved scissors, only a thin layer being left to support the mucous membrane of the bladder and prostatic urethra, which was left intact. A perineal tube was inserted, the wound was packed with iodoform gauze, and during the six days in which the tube was kept in the whole of the urine passed through it, not a drop escaping beside the tube, thus obviating any chance of infection of the deep ischiorectal wound till it had partly filled up and was covered by healthy granulations. The patient left the surgical home untroubled by any urinary symptom, and is now quite well. This method, with its advantages, is inferior to McGill's operation for cases of enlarged middle lobe projecting into the cavity of the bladder. In very fat patients, too, or when the prostatic tumor is very large, it may not be feasible, because the finger may not be long enough to hook it around the growth.

One of the most remarkable effects of castration is the decided improvement in the symptoms that sets in in many cases a few hours after the operation, particularly in the diminution of pain and in the spontaneous

passage of urine when all expulsive power had been previously lost. The most serious drawback is the high mortality — at least twenty per cent—owing to the advanced age and, in many cases, the broken constitutions of the patients. Mental disturbances, sometimes amounting to mania, occasionally follow the operation. When the period is reached when a man will consent to the removal of his testes, the castration is in itself an operation attended by a heavy mortality.

Vasectomy consists in division or excision of a portion of the vas deferens. General anesthesia is advisable, but the operation may be performed by local injections of cocaine. After the parts have been shaved and rendered aseptic, the vas is searched for in the upper part of the scrotum. It is grasped between the finger and thumb of the left hand and brought as close to the surface as possible. An incision an inch long is made directly over and along the course of the cord, and the dissection is carried down to the vas, which is recognized by its white, glistening appearance. It is grasped by toothed catch-forceps, a blunt hook is passed beneath it, and a loop is withdrawn through the wound after separating it from the enveloping fascia. A ligature may be tied around the loop, which is cut off, or separate ligatures may be applied an inch or more apart, and the intervening portion may be cut away. The skin wound is closed by one or two sutures. The vas on the other side is dealt with either at once or after an interval of a few days. This latter course is safer and less liable to be followed by mental disturbance. Freyer has performed this operation in a considerable number of cases without mortality. He says that he cannot imagine death resulting from such a comparatively simple operation alone.

Vasectomy effectually prevents the recurrent epididymitis and orchitis which are such painful and distressing complications in prostatic patients. It is neither so rapid in its results nor so radical a cure as castration.

When in the advanced stage of prostatic enlargement the capacity of the bladder is much diminished in size, all expulsive power is lost, and severe cystitis exists, it may be necessary to draw off the urine by the catheter every hour, or even more frequently. Under such circumstances the bladder must be drained, temporarily or permanently as the case may require, through an opening made either in the perineum or above the pubes, thus obviating the introduction of the catheter and giving the bladder complete rest.

To effect drainage of the bladder above the pubes the operation is the same as suprapubic cystotomy for stone.

The perineal is a much less serious operation than the suprapubic. When, therefore, drainage alone is required, and this is to be of a temporary character, and particularly if the patient be very feeble, the former operation should be selected. By suprapubic cystotomy the bladder at the same time that it is drained can be throughly explored and a stone or prostatic growth can be removed. Thick, dense flakes of muco-pus and phosphatic grit which may adhere to the walls of the bladder can be scraped off by the fingernail or scoop and removed by irrigation.

## Reviews.

REPORT OF THE SURGEON-GENERAL OF THE UNITED STATES ARMY FOR THE FISCAL YEAR ENDING JUNE 30, 1900. Washington, 1900.

This report, interesting to every medical man, begins with a financial statement which adequately accounts for the $1,500,000 expended during the year. It is interesting to note that 544 specimens were added to the Army Medical Museum, and that over 7000 medical books, theses, and pamphlets were added to the library. In the bacteriological laboratory of the United States General Hospital, 5574 examinations were made, and the description of this work is extremely interesting. In the section devoted to the health of the army, it is gratifying to note the extremely small proportion of disabilities and discharges due to venereal disease. The section treating of the Division of the Philippines will probably be read with special interest; it is made up mainly of reports from officers in the field. A similar series of reports is published from the surgeons serving in Cuba.

In considering the prevalence of special diseases it is noted that the mortality of typhoid fever was about 11.81 per cent as opposed to 10.48 per cent during the epidemic of 1898. The mortality rate was lowest among the troops serving in the United States, and highest in the garrisons of Cuba. It is noted that in 1899 there was a somewhat greater prevalence of typhoid fever among the regulars than among the volunteers; there was, however, a much smaller number of cases infected. This is attributed to the care

exercised in the water-supply, removal of excreta, and thorough cleanliness of the camps and their surroundings.

During the year 1899 there occurred among the troops 262 cases of yellow fever, with 55 deaths. It is noted that 204 cases of cerebro-spinal meningitis are recorded, with 120 deaths.

There is an extremely interesting and instructive report upon malarial fever and dysentery.

Venereal disease seems to be more than usually prevalent. Gonorrhea claimed the greatest number of victims, chancre followed next, and syphilis took third place. Nor is it particularly comforting to find that the number of these cases compares favorably with that for the British army at home or abroad.

Major Ives, noting the increasing prevalence of disease among the troops of Matanzas and Santa Clara, instituted measures for its repression. He subjected all enlisted men to weekly examination, and treated those who showed signs of disease, depriving them while under treatment of canteen privileges and passage from the garrison. The system, opposed at first by the officers, is said to have given excellent results.

There is also noticed an increased rate of alcoholism. This is due to the rapidity with which the army was recruited.

In the tabulation of injuries it is noted that gunshot wounds stand third in the list, contusions and sprains taking first place. There were ninety-nine deaths from drowning reported in 1899; seventy-eight of these occurred in the Philippines. There is a most instructive tabulation of gunshot wounds, and a suggestive one concerning suicides and homicides. It is, perhaps, not unnatural that with the increased proportion of venereal diseases and alcoholism the percentage of homicides should have nearly doubled in 1899.

Dr. John McG. Woodbury has submitted a report on the medical conditions in the German army as seen by him during the field maneuvers of 1899. A point of great practical importance impressed in this report is the care devoted by the German Medical Corps to the feet of the army. Each man's feet are inspected by one of his company officers and a medical officer and an assistant at least twice a week in barracks, and oftener in active field maneuvers. The companies are formed in squads standing upon tables or benches sufficiently high to bring the feet directly under the eye of the inspecting officer, and to bring to his observation any wincing or flinching when the inspected man jumps to the ground barefooted. The inspecting officer passes down the line, carefully examining the front of the feet and legs, which are bare to the knees. He searches for sprained tendons, blisters, improperly cut nails, or untrimmed corns. The men are about-faced, and the tendo Achilles carefully examined. As they raise one foot and then the other, the soles are carefully inspected. When each man has been thus examined, he leaps to the ground and runs to his shoes and stockings; this is to show any bruised soles or inflammation of the ankle bones. In case blisters or improperly cut nails or tenosynovitis are found, they are at once cared for by an assistant. At the same time each man's socks and boots are carefully inspected as to the condition of cleanliness. Every thirty days the entire body of each man is inspected.

The report closes with a series of statistical tables.

INTERNATIONAL CLINICS. A Quarterly of Clinical Lectures and Specially Prepared Articles. Edited by H. W. Cattell, A.M., M.D. Volume IV, Tenth Series.
Philadelphia: The J. B. Lippincott Company, 1901.

This, the fourteenth, volume of the Tenth Series of International Clinics opens with an article upon the United States Pharmacopœia by Professor H. C. Wood, and with articles upon Heart Disease, Raynaud's Disease, and the Relationship of Mosquitoes to Malaria. Following these articles there is a symposium on Genito-Urinary Diseases; a series of articles on Medicine; one on Neurology; one on Surgery; an exhaustive article on Blastomycetes or Ferments in the Etiology of Cancer; a description of Laboratory Methods by Dr. Geddings; and finally a monograph entitled "The Etiology and Morbid Anatomy of Various Diseases," by Henry W. Cattell, the editor. The volume is carefully edited, well printed, and easily read, and maintains the reputation of its predecessors.

A TEXT-BOOK OF PRACTICAL OBSTETRICS. By E. H. Grandin, with the Collaboration of G. W. Jarman, M.D. Third Edition, Revised and Enlarged. Illustrated.
Philadelphia: The F. A. Davis Company, 1901.

The fact that this book on obstetrics has passed to its third edition in the space of five years indicates that it contained much which interested the profession. A good many of the illustrations which are found in

it are taken from life by photography, and some obstetrical operations are also reproduced in this manner. Others are photographs which are taken from obstetrical operations performed on the mannikin. These illustrations are much better than those which are diagrammatic in character, many of which are very crude. The book can hardly be considered as a text-book for the general student, but more as an aid to careful obstetrical study and diagnosis. In other words, it is a book which the practitioner will peruse with much benefit, and not exactly the book which one would recommend to the undergraduate student, as it is not sufficiently elementary, and is not arranged for early study in this branch of medicine. Its teachings are, however, safe and reliable, and from these points of view it can be most cordially commended.

THE JOHNS HOPKINS HOSPITAL REPORTS. Volume VIII.
Baltimore: The Johns Hopkins Press, 1901.

The present issue of these Reports is a most interesting one to the practitioner of medicine. It contains seventeen papers, all of which deal with typhoid fever and its complications and sequelæ. The opening article is by Dr. Finney upon the Surgical Treatment of Perforated Typhoid Ulcer, and is followed by one upon laparotomy for the same condition by Harvey W. Cushing, M.D., by another by Dr. Flexner upon Unusual Forms of Infection with Typhoid Bacillus, and by others upon puerperal infection with this bacillus; gall-bladder infection; liver infections; the disinfection of infected typhoid urines; infection of the urinary bladder; and observations on the blood in typhoid fever—all which are based upon the personal examination of cases of this character and upon a study of the literature concerning the subjects discussed. The report is another monument to the industry of the Johns Hopkins Hospital workers.

A RETROSPECT OF MEDICINE. Edited by James Braithwaite, M.D., and E. F. Trevelyan, M.D. Revised, December, 1901.
Simpkin, Marshall, Hamilton, Kent & Company, 1901.

This is a continuation of the well known Retrospect which is familiar to so many readers through many years' publication. It is as ably edited and contains as much useful information as it always has contained, and there is no sign of its losing its vigor with its increasing years.

# Correspondence.

## *LONDON LETTER.*

BY RAYMOND CRAWFURD, M.A., M.D. OXON., M.R.C.P. LOND.

A very important discussion was recently introduced by Dr. Louis Parkes at the Epidemiological Society of London on the prevention of water-borne enteric fever amongst armies. The question is naturally one that at the moment excites universal interest on account of the terrible mortality from this disease among the troops in South Africa. Regarded, however, from the purely statistical point of view, the incidence and the mortality has not reached the degree that has occurred in other large armies in the field in recent years. It is instructive to note that while at home we are accustomed to look on water as the cause *par excellence* of enteric fever in the field, there was much less ready acceptance of this view by the numerous medical officers at the meeting who had accompanied the army in South Africa. There was as a matter of fact but little enteric fever among armies on the march, when water would be taken haphazard from all sources, and when purification was next to impossible. On the other hand, it was the constant scourge of standing camps, where water could be most readily dealt with. Infected latrines are probably the chief source of trouble, and from these the disease is disseminated by dust and flies and other agencies, of which water was one of the less important. However, there can be no doubt that whatever share water may take in its propagation, it would be disastrous to allow any chance of contamination of the water-supply.

Surgeon-Major Macpherson gave his experience of various chemical methods of purifying water. He had tried the German bromine method in the Soudan expedition, but it had been found wanting, as the impatience of the thirsty soldier would not tolerate the considerable time necessary for the successive stages. Similarly the hypochlorite method had been abandoned because the amount necessary to sterilize the water seriously impaired its taste, and there was the added difficulty that the salt was difficult to carry in the solid state. The French method of Lepeyrine, which consisted in carrying in a case fixed in the water-bottle a powder containing permanganate of potash,

carbonate of sodium, carbonated lime, and alum, had also been abandoned for the sufficient reason that the permanganate did not destroy the bacillus typhi. The Belgian method of Professor Bergé was far too complicated for the use of troops in the field: it consisted in evolving peroxide of chlorine by adding one or two drops of sulphuric acid to some crystals of chlorate of potash in a flask, and by means of two tubes passed through the cork, one connected with the water and the other with a force pump, driving the gas through the infected water. In the present South African campaign there had been in use a single candle pump filter manufactured by the Berkefeld Filter Company, and it seemed to have answered its purpose well, in spite of the liability of the filter to become choked, which needed some little precaution.

Duckworth and Garrod contributed an instructive paper to the last meeting of the Royal Medical and Chirurgical Society on a case in which intestinal sand was passed, with a survey of the main features of several other cases. In the clinical history of this case there was little of special note, as the case in the main reproduced the symptoms that have been present in the recorded cases. Pain, however, was much less and never amounted to true colic. There was the usual history of gout in the family, and the patient was a woman of thirty-three years, the average being about thirty-five. Mucous colitis was present.

When washed and dried in the air, the sand was of a deep-brown ground color, with an admixture of pale or almost colorless particles. The particles were of various shapes, but there was no evidence of crystalline form—some were opaque, some translucent. Their longest measurements varied between 0.05 and 0.2 mm. No cellular elements were to be seen, and it was clear that the deposit was not a granular débris. It was thronged with micrococci and bacilli. Over sixty per cent of its bulk consisted of inorganic material, and calcium phosphate was the chief mineral constituent, while traces of magnesium were present. Examination of the pigment of the sand suggested that urobilin was the chief coloring matter. The case was evidently one of the passage of true intestinal sand, quite distinct from the false sand, which is composed of remains of vegetable foods which have resisted the action of the digestive fluids, and may have become incrusted with earthy salts. Such a sand is that associated with the passage of hard particles in the flesh of the pear, hence known as "pear sand;" the cellular structure of such particles can be readily recognized by the microscope. A similar black sand is derived from bananas.

The authors discussed the seat of formation of *true* intestinal sand, which is clearly of animal origin. It cannot originate in bile, as cholesterine is absent and bile pigment present only in traces. Presumably it originates in the intestinal canal; this is suggested by the association of mucous colitis, by the character of the organic material, and the abundance of bacteria. The abundance of urobilin and the scantiness of unaltered bile pigments suggest that it is formed at a site where the transformation of bile pigment into urobilin is far advanced; such a site is the upper part of the colon. The prominence of calcium salts is consistent with the fact that the excretion of calcium is believed to be effected largely by the intestine. The richness of milk in lime salts would suggest the avoidance of a largely milk diet in such a case as this.

The discussion at the British Balneological and Climatological Society on anemia and its therapeutics was of interest not because of anything that it contributed to our knowledge of the disorder, but by laying bare the depths of our ignorance. We can no longer rely even on the evidence supplied by examination of a drop of blood, inasmuch as there is evidence to show that it cannot be regarded as a sample of the whole blood. Moreover, Haldane and Lorrain Smith's researches on the bulk of the blood had tended to show that in chlorosis we have to deal rather with an increase of the plasma than a diminution of the hemoglobin. The difficulty in accepting this conclusion lies in the fact that if the plasma is increased, hemoglobin and hemocytes should be equally and simultaneously diminished, which is not the fact, for the essence of chlorosis, as we believe rightly or wrongly, consists in the diminution of hemoglobin not necessarily with any diminution of the number of hemocytes. An increase of plasma might offer some explanation of the prevalence of chlorosis at and about puberty, and its apparently exclusive incidence on the female sex. We know that the specific gravity of the blood is diminished at puberty, presumably also from an increase in the absolute bulk of plasma, and it may

be that this is an effort of nature to lay up a reserve storage of nutriment for the purpose of gestation. Professor Allbutt pointed to the dilatation of the heart and the voluminous pulse as significant of increased blood bulk in chlorosis. Accepting this hypothesis, one is further than ever from an understanding as to the means by which iron cures chlorosis. It would, however, suggest the removal of the chlorotic to high altitudes, at which Oliver has shown that the plasma undergoes a degree of concentration sufficient to suggest that the hemocytes have undergone an increase in numbers. Oliver, however, assigns this concentration to the dryness of the air rather than to the elevation. The evidence produced by other speakers in this discussion served to confirm Professor Allbutt's view that damp localities and low altitudes were unfavorable to the cure of chlorosis, and favorable to its development.

Herringham communicated to the Pathological Society of London his observations on the condition of the renal arterioles in chronic Bright's disease. With regard to the adventitia he found that it varies not with the condition of the other arterial coats, but with that of the general interstitial tissue of the cortex; he considers that the adventitia should be regarded rather as a part of the connective tissue of the kidney than as a coat of the vessel. With regard to the middle coat he employs the method of measuring the cut transverse section and comparing it to the measurement of the lumen and of the other coats; but he avoids the obvious fallacies of this method by also examining longitudinal sections of the muscle coat in which the nuclei of the muscular coat could be counted. Comparing thus sections from six healthy kidneys and from thirty-four cases of various forms of Bright's disease, there was not a single instance in the latter of true hypertrophy or hyperplasia of the muscle coat; on the other hand, there was evidence in the direction of thinning of this coat and diminution in its nuclei. This is the case not only in advanced disease, but also in the very earliest stages. Fibrosis of the media, however, is not uncommon; changes in the intima are very common. The increase of elastic tissue in the larger arterioles is not generally known, although it is easy to decipher the concentric rings of elastic tissue; in this layer the earliest change seems to be a swelling of the elastic tissue with subsequent splitting into layers between which cells derived from the original membrane lie. Hyaline endarteritis appears to be the form of endarteritis proper to the smaller arterioles; it always occurs along with the above named changes in the elastic layer in the large vessels. Probably the process is the same, varying however in its outward form according to the size of the vessel. Besides these changes in the intima, there is seen sometimes in the larger arterioles a cellular increase, probably formed from the endothelium, and internal to the above changes. The occurrence of Bright's disease in young people without arterial change shows that Bright's disease is at any rate not invariably caused by endarteritis; while the occurrence of endarteritis without affection of the renal tissue shows that the arterial disease is not the result of chronic inflammation of the surrounding renal tissue. Indeed, the two conditions seem to be quite independent, and endarteritis is very much a matter of age. Nor is there any relation between the amount of change in the arterioles and in the other tissues of the kidney. Bright's disease might predispose to arterial degeneration by its profound influence on general nutrition, but probably not by mechanical obstruction or chemical irritation of the vessels. Herringham rejects the theory that refers the increased pulse tension to obstruction of the peripheral vessels, and regards it as the effect of the disease in the large arteries, by which the function of these as elastic reservoirs is perforce transferred to arteries of smaller size.

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## *PARIS LETTER.*

By R. H. Turner, M.D. (Paris).

Professor Robin has been advocating of late a new drug in the treatment of anorexia. This drug is the pure solution of persulphate of sodium, also called persodine. This would seem to be, according to Professor Robin, one of the best aperients known in ordinary forms of anorexia, as well as in consumption. The drug is given as follows:

> Persulphate of sodium, 2 grammes (30 grains);
> Water, 300 grammes (10 ounces).
>
> A soupspoonful a half-hour before lunch and dinner.

After six days the appetite is awakened. If no result is obtained during this period it is useless to persevere, but after some rest persodine can be tried again.

Another drug recommended by Professor Robin is metavanadate of sodium, to be used

for the same purpose, and which produces sometimes better results than persodine.

Metavanadate of sodium, 0.03 centigramme (½ grain);
Water, 150 grammes (5 ounces).

Each teaspoonful contains a milligramme. A teaspoonful is given half an hour before lunch and dinner. The use of this drug should only be continued four days, and then a rest should be taken. This treatment cannot be recommended in cases of cancer of the stomache, but it has succeeded with tuberculous patients.

Professor Potain, who enjoyed a world-wide reputation as a heart and lung specialist, died suddenly during the night extending from the 4th to the 5th of January. The night before he had gone to sleep most quietly. He was one of the most perfect types of a good physician, kind-hearted and sincere, and placing his profession above all things. Potain was seventy-five years old when he died, and he had given half a century to the practice of medicine. He was made a member of the Academy of Sciences when Charcot died. The clinical instruction he gave referred more specially to heart affections, and the greater part of it is found in his "Clinical Lectures at the Charité," which were published by Dr. Vaquez, his former interne.

At a meeting of the Dermatological Society, which took place last month, a woman suffering from leprosy was shown to the members. Born and brought up at Nice, this woman had never left France and had never seen any people suffering from leprosy. Every year, however, she used to go up into the mountains to spend several months, and it seems that there are still a few places where leprosy exists, the disease, however, having a tendency to die out. In the middle ages there were about two thousand leproseries in France, which shows how many cases there must have been.

At a recent meeting of the Society of Therapeutics Dr. Legrand spoke on the treatment of smallpox. One frequent symptom is considerable gastric intolerance with frequent vomiting of bile. A good preparation in these cases is the following:

Hydrochlorate of cocaine, 10 centigrammes (2 grains);
Syrup of ether,
Syrup of codeine, āā 30 grammes (1 ounce);
Chloroform water,
Mint water, āā 60 grammes (2 ounces).

A dessertspoonful every hour.

As for the general treatment, the formula used was as follows:

Ammonium acetate, 3 grammes (45 grains);
Tincture of opium, 30 grammes (1 ounce);
Elixir of cinchona, 60 grammes (2 ounces);
Simple elixir, q. s., 200 grammes (7 ounces).

One soupspoonful every hour.

The nineteenth German Medical Congress will be held in Berlin from the 16th to the 19th of April, 1901, under the direction of Professor Senator. The therapeutics of the heart and vasomotor drugs will be discussed by Dr. Gottlieb, of Heidelberg, and Dr. Sahli, of Bern. Leyden, of Berlin, and Redlich, of Vienna, will discuss the various forms of inflammation of the medulla; the surgical treatment of hypertrophic cirrhosis of the liver will be the subject of an address by Dr. Hirschberg, of Frankfort-on-the-Main; and the condition of blood tension in the treatment of chronic affections of the heart will be discussed by Dr. Schott, of Bad Nauheim.

It is a fact which cannot be gainsaid that typhoid fever is sometimes contracted inside a hospital, and at a recent discussion held on this subject at the Medical Society of the Hospitals several cases were reported. Dr. Troisier said that it would be well to change the system in use at the Beaujon Hospital. Near his two wards there are three faucets, and two of them furnish Seine water. It would not be a matter for surprise if the patients and even the nurses made the mistake of using the wrong faucet. One of his patients was having her stomach washed out, and thirty-six days after her entrance into the hospital she began suffering from typhoid fever. Dr. Ballet, the well known neurologist, physician at the St. Anthony Hospital, spoke of a similar case where the water used for bathing the patients infected a patient and a nurse at the same time. Professor Letulle, physician at the Boucicaut Hospital, described how in three years seven cases of typhoid fever had taken place, and amongst these five had not been near any typhoid fever patient. Dr. Vincent remarked that the nurses might have been infected by touching soiled objects and then not washing their hands before eating.

Dr. Martinet, former interne of the Paris hospitals, has published recently an article in the *Presse Médicale* on the best methods of giving digitalis. When first used in 1775 by Withering and others, the infusion, or the powdered leaves in pills, were the only prep-

arations known. Various tinctures were discovered later on, but it was only in 1845 that Hourolle, using the methods employed by Pelletier and Caventon, isolated a product which is known at present under the name of amorphous chloroformic digitaline of the Codex. Somewhat later Nativelle isolated a crystalline alkaloid, which proved to be much more active than the first product. Schmiedeberg in Germany has isolated various products; one of them is called digitoxin, and would seem to be the active principle. However, at the Thirteenth International Medical Congress Dr. Lauder Brunton indicated in his report that he considered that their action was identical though not of equal intensity. Crystalline digitalin is always the same in its action; it is therefore preferable to use this preparation rather than digitoxin. *Digitalis purpurea* is a plant which grows in many countries, and the quantity of active principle contained in the leaves of the plant varies so much according to the land it is grown in that doses of an infusion of twelve to fifteen grammes are given in Scotland or Roumania, whereas in London the dose is reduced to three or four grammes, and sinks in France to one gramme. One can readily understand how difficult it is to establish any fixed dose, as such a course might lead to grave accidents as well as to unsuccessful trials. It has been calculated that one milligramme of crystallized digitalin of Nativelle is equal to fifty drops of the glycerin and alcohol solution of Petit, and to two and a half grammes, or 128 drops, of the alcoholic tincture commonly used, or to 0.40 centigramme of the powder made with the fresh leaves of the plant. It should be remembered, however, that there are other products besides digitalin in the leaf, and this argument has been employed to combat the use of the alkaloid. Digitalin is generally prescribed in France by means of the following formula (Petit):

> Chloroformic crystallized digitalin, 1 gramme (15 grains);
> Glycerin (specific gravity 1250), 300 Cc. (10 ounces);
> Distilled water, 150 Cc. (5 ounces);
> Alcohol (95-per-cent), q. s. ad 1000 Cc. (1 quart).

This preparation can be given in water or milk, and fifty drops was the usual dose given by Dr. Potain, the celebrated heart specialist, who died recently, though some physicians, like Professor Fernet, administer fifteen drops three days in succession. Next to this preparation the best means of giving digitalis is to use the maceration, which however contains no digitalin, as this alkaloid is insoluble in water. Digitalin and the salts of potassium are undoubtedly the active principles. When giving digitalis Professor Huchard's aphorism should be borne in mind—"neither too much nor too little, neither too often nor too long." A fault often made is to give digitalis in small doses for a lengthened period. Rest in bed, purgatives, and even bleeding and cupping, are indicated. Children should not be given digitalin, but the infusion (one centigramme for each year), or better still the tincture, may be employed. Three drops may be given to a child one year old, 9 at six years, 15 at five years, 18 at eight years, and 20 at the age of ten years.

Dr. Lermoyez, who is one of the best known specialists in ear troubles, has written recently an essay on the care of the organs of audition, in which he shows how important it is to watch the hearing from earliest childhood. There is a French saying that one is usually deaf without knowing it, and there is a good deal of truth in this, as one's sharpness of hearing may diminish imperceptibly. When no sign has drawn attention to the fact that the ear is affected, the change is only noticed when it is already too late. The perception of sound does not exist at birth, though sight, touch, taste, and olfaction are already developed.

The hearing should be examined at the age of six months, and if the child seems to be indifferent to the sounds that are produced around him, the attention of an aurist should be called immediately to the fact. Deafness at this age is rarely due to a congenital defect, but more often to an acute otitis which has been overlooked. Toward the age of two years, if the child does not seem to begin to talk, one should consider the possibility of a defect in his hearing. A good way of telling whether the child is deaf is to put out the lights and then talk to him. Von Tröltsch, the great German aurist, has said that the intelligence of a child depends in a great measure on his hearing, and so during childhood this question is of great interest; many boys and girls who are thought to be backward in their studies are simply suffering from adenoid vegetations or some such trouble. It seems that out of one hundred schoolchildren twenty suffer from this affection, and that twenty-five per cent cannot write from dictation at a distance above six meters. The greater part suffer from adenoid vegeta-

tions, but some from cerumen or else chronic otorrhea. Moure has rightly remarked that two-thirds of these cases can be cured, whereas later it is difficult or impossible. When therefore the child is about seven years old, he should be examined as to the distance at which he hears distinctly, and given a place in the schoolroom in accordance with the result of this examination. Later on in life, when the choice of a career is to be made, it is of importance to remember that some professions or occupations require greater acuity of hearing, such as that of a physician. In case there is a perforation of the drum of the ear, it is best to avoid a seafaring life. If there is hardness of hearing it is best to keep away from large cities, where the noise is apt to be productive of a modification in the quality of one's hearing. In some professions, such as that of engineer, the work itself is apt to cause a modification of the hearing, and some are no longer able to perceive the different sounds, such as whistles or bells, which are the means of signaling from one train to another.

At one of the last meetings of the Society of Biology Drs. Gilbert and Fournier read an essay on the use of lecithin as a therapeutical agent. This body has already been studied by such authors as Danilewsky, Selensky, Serondo, and others. Its special action consists in favoring the assimilation of nitrogen and phosphorus. Such is the conclusion reached in their work on the subject by Desgrez and Zaky. The variety of lecithin used by Dr. Gilbert was that which was extracted from the yolk of eggs. This substance was administered either in one large dose of from two to five grammes, or else in small doses of ten to twenty centigrammes, each day.

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### *THE TREATMENT OF TRACHOMA.*

To the Editor of the THERAPEUTIC GAZETTE.

SIR: There are always two things to consider in the treatment of trachoma: first, how to accomplish the removal of inflammatory complications and the attendant hypersecretion; secondly, what means to adopt to further the disappearance of conjunctival hypertrophy.

I have had quite an extensive experience in the treatment of this disease, always using the well known remedial agents such as silver nitrate, but with only fair results. About six months ago I began to employ mercurol, at first in a two-per-cent solution. I soon observed that better results were obtained as I increased the strength of the applications, until finally I found myself using the dry powder itself.

In all cases in which I use dry mercurol the purulent secretion quickly ceases to appear, the conjunctivæ become smooth, the hypertrophy diminishes, and the pannus clears up in a short time. I obtain the best results by applying the powder directly to the everted lids, once a day until the inflammatory symptoms begin to subside, then each alternate day for a few times, and afterward once a week, until the disease is cured. In making the applications I use a small probe wrapped with cotton, or a small camel's-hair brush, taking care to cover the entire palpebral conjunctiva. The mucous membrane first becomes yellow, then red, when the mercurol is at once washed off with normal salt solution or a solution of boracic acid.

Although I have made use of this mode of treatment in a number of cases, I will report but two of them. The first, a laboring man, thirty-six years of age, came to me in the spring of 1900 with an acute trachoma, and I treated him for about six weeks with silver nitrate, etc. He improved to the extent of becoming able to return to his employment upon a railway, and I lost sight of him until November, when he returned with a chronic trachoma with pannus. The vision in each eye was 10–200. Although treatment with silver nitrate was at once instituted and continued for eight weeks, there was very little improvement and the vision remained as it had been. At this point I began to use powdered mercurol, with the result that the discharge lessened, the pannus began to clear up, the conjunctiva became smooth, and at the end of three weeks the patient could read 10–10 with both eyes. The symptoms had entirely disappeared at the expiration of six weeks.

My second case was that of a merchant, twenty-eight years of age. In December he came to consult me concerning an attack of acute trachoma. I began treatment at once with powdered mercurol, and in ten days the symptoms had entirely disappeared.

I may add that I have as good if not better results than formerly, in acute conjunctivitis, from the use of the dry mercurol, and with the advantage of causing but slight pain.

Yours truly,

R. D. SLEIGHT, M.D.

MAPLE RAPIDS, MICHIGAN.